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JPRS-EEI-84-041

9 April 1984

# East Europe Report

## ECONOMIC AND INDUSTRIAL AFFAIRS

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9 April 1984

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**ECONOMIC AND INDUSTRIAL AFFAIRS**

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INTERNATIONAL AFFAIRS

CEMA COOPERATION IN ANIMAL HUSBANDRY, GRAINS, AGROTECHNOLOGY REVIEWED

East Berlin INTERNATIONALE ZEITSCHRIFT DER LANDWIRTSCHAFT in German No 1, 1984  
pp 3-5

/Article by Z. Akhtarov, Bulgarian Academy of Sciences, Peoples Republic of Bulgaria:  
"Results of Scientific-Technical Cooperation in the Agricultural and Foodstuffs Eco-  
nomies of CEMA Members"/

/Text/ The Complex Program for the Further Deepening and Perfection of Cooperation and Development of Socialist Economic Integration by the CEMA member countries assigns great importance to cooperation in agriculture and the food industry. With this objective in mind, nine agreements were concluded and several coordination centers established to work on the outstanding scientific problems of farming: On breeding important agricultural crops; on mineral fertilizers; on work on the biological bases of animal husbandry; on the mechanization, automation and electrification of farming; on pest and disease control in agricultural crops; on the use of management-mathematical methods in farming, and so on.

Within a short delay more than 400 developments were completed and proposed for introduction to farm production or utilization in scientific work.

Significant work has been done on the problem "the preparation of theoretical bases and new methods of breeding and producing seed and new processes for the creation of higher yielding and high quality varieties and hybrids of farm crops." Many new varieties and hybrids of wheat, barley, rye, triticum and other kinds of crops were bred; more than 200 of them were forwarded to the state variety testing agencies and 78 licensed in the CEMA member countries.

A constant exchange of new varieties, hybrids and lines was organized. A joint center for the exchange of initial breeding material was set up; this has already forwarded 12,000 seed samples to the breeding stations of the socialist countries.

Soviet varieties of wheat account for 18-40 percent and of sunflowers for 53-99 percent of the fields bearing these crops in the CEMA member countries. In the Soviet Union 20 percent of corn and 12 percent of barley varieties planted originate in other socialist countries. This exchange of varieties has effected a noticeable rise in yields. In Bulgaria, for example, wheat yields doubled, and so did the production of safflower oil per unit of land. The wheat yield rose by 7 dt/ha /decitons per hectare/ in the CSSR, and in the USSR the yield of corn and barley rose by 5-10 percent.

We succeeded--for the first time anywhere--to obtain seven new varieties of triticale as the result of crossing rye and wheat. In Bulgaria we tested 213 triticale varieties. Most are short stalked, ripen early and have high yields. Their grain yield exceeds that of wheat, and their green mass yield that of rye by 20-30 percent. In the Soviet Union two new and high-yielding triticale varieties are being introduced for green fodder and silage production, and two grain varieties (Iskra and AD 206) in crop production.

Hungarian breeders elaborated an original method for breeding hybrid wheat by crossing five varieties. Two short stalk varieties were bred by this method and licensed. Both yield 10 percent more than the standard variety "Mironovskaya yubileynaya 50," are suitable for baking and disease resistant.

Other new and high-yielding varieties came from the GDR and are now planted in Poland, the USSR (western Ukraine) and other CEMA countries as well as in the GDR.

In the last five-year plan period, 10 early ripening winter wheat varieties were bred in the CSSR: they have a potential yield of 100 dt/ha.

In the USSR the following new winter wheat varieties are being tested and introduced by the State Variety Testing Agency: Kharkovskaya 81 which, without irrigation, yielded 83.9 dt/ha and on irrigated fields 97.4 dt/ha; Krasnodarskaya 57, Pavlovskaya, Prikubanskaya and others. They do better than the licensed varieties by yielding 2-7 dt/ha more and are distinguished by better resistance to drought, winter weather, brown and yellow rust and also by suitability for baking.

Among the summer wheat varieties licensed in Mongolia were Nutans 264 and S 900. Their yield exceeds that of the former standard varieties by 13-18 percent.

In the Soviet Union 30 short stalk varieties of various types of rye have been bred, some of them exceed the yields of the initial long stalk varieties. They are, for example, Kustro by 10 dt/ha, Kharkovskaya 55 by 17 dt/ha, Kharkovskaya 60 by 22 dt/ha Cguzkubsjata 2 by 20 dt/ha higher yields.

The agrotechnology worked out by the scientists of the countries of the socialist community is directed to the fullest possible utilization of the genetic potential of the high-yielding grain varieties, taking into account their agrobiological features. The results achieved benefit the further development of grain production in the socialist countries. The work on the establishment of a semi-automated system for the appraisal of field tests in various stages of breeding has been completed. This system has turned out to be extremely efficient and reliable; it is being introduced to the practice of the breeding facilities.

Interesting data on metabolic change in plants were gathered upon using radiation and radioactive isotopes. Two new processes were developed for the anterior radiation treatment of seeds and seedlings; the result was a 12 percent increase in the yield of corn and a 15-40 percent rise in that of vegetable seed varieties. Radiation is widely used to fight pests preying on crops and damaging stored farm produce.

Also completed were important items of basic research on heterosis and remote hybridization, the results of which are being used to speed up and simplify the work of hybrid breeding for corn, tomatoes, sunflowers, sugar beet, wheat and others.

Significant successes were achieved by joint work in animal husbandry. Stimulants were developed, that cause beef cattle to gain 10-15 percent greater increases in live weight, pigs to gain 10-20 percent. Moreover, when used, these stimulants cut the period of fattening of the livestock mentioned by 5-15 days, fodder consumption per unit weight gain declines by 5-15 percent, and the susceptibility to disease as well as stock losses are reduced by 3-5 percent.

In recent years the socialist countries concluded agreements on specialization and the reciprocal use of gene pools of 14 fat beef cattle breeds, 20 pig breeds, 29 sheep breeds, 4 goat breeds, 14 dairy cattle breeds and 16 kinds of fresh water fish. In the USSR the use of the common gene pool of pig breeds helped raise productivity and expand pig stocks by 10-20 percent; in Hungary, Soviet pig breeds were used to achieve a significant rise in the fertility of domestic breeds; in Mongolia local breeds crossed with Soviet beef cattle breeds achieved a 25-30 percent gain in milk and meat yields by the descendants of the crosses.

Cooperation with common use of the gene pool of plants and livestock is a valuable contribution to the resolution of the food problem in the socialist countries. With regard to the feeding of farm animals, we worked on the problem of using synthetic nitrogen as a food additive for ruminant feeding as well as synthetic lysine and methionine as feed additives to pig and poultry feed, and the economic benefit has been great.

Joint research is proceeding on the eradication of dangerous livestock diseases. A new and original procedure was developed for the ultrafiltration of cells and concentrated viruses and highly efficient vaccines obtained against pig and beef cattle diseases. A special central vaccine fund was established with the designation "Asia 1" to fight foot and mouth disease.

In the scope of cooperation among the research institutes of the CEMA member countries, 26 projects for the construction of fully mechanized and automated large-scale facilities and barn complexes were advanced to operational status.

The preparation and introduction of mathematical methods and EDP /electronic data processing/ to farming achieved important results, especially with regard to automated data processing in animal husbandry. With the aid of the SELEX-CEMA system, national variants of the various sections of the system (processing of the data on breeding, on veterinary affairs, and so on) were elaborated and introduced.

Original and efficient methods for the production of plant protection aids and their application were studied with regard to the topic "development of new plant protection aids, the drafting of biological and other methods of plant protection and the comprehensive study of the effect of plant protection products and pesticides on the environment." More insects were traced for biological attacks on pests in crop cultivation, new microbial plant protection substances and 319 chemical preparations for disease and pest control in crop production developed, 93 of which were recommended for use in the socialist countries.

Scientists from the CEMA countries have worked out common methods and measures to combat wind and water erosion and soil salinity.

A forecast decided the main orientation of scientific-technological progress through 2000 with regard to the comprehensive mechanization and automation of farm production.

The Permanent CEMA Commission for the Food Industry opened up new spheres of cooperation and approaches to the increase in the economic interestedness of economic organizations and research institutions in the further expansion of mutual contacts. The most important problems to be resolved in the food complex of the CEMA member countries are reflected in the five-year plans of scientific-technical cooperation. These plans provide for the implementation of a broad range of common studies on the most efficient use of raw materials and the improvement of the quality of foodstuffs the technical transformation of the branches of the food industry by the development of new and modern machines, complete technological lines and processes, and the complete processing of raw materials and byproducts.

In 1980 the CEMA member countries concluded agreements on cooperation in the oil and fat, sugar, meat, canning and dairy industry as well as in inland fishing. Research institutes and experts dealt in particular with the production of new kinds of child nutrition and dietetic foods, fruit and vegetable juices, the development of new equipment and the design of machines for harvesting and processing tomatoes, cucumbers, plums, cherries, grapes and other fruit and vegetables as well as modern methods and processes for sterilization and conservation.

In fulfillment of the Complex Program and the agreements concluded, we are now working on more than 500 scientific-technical tasks; many results are already effective in production. The manufacture of more than 600 products has been organized in accordance with the technical documentation of CEMA scientists and specialists; projects were launched for the construction of meat and dairy combines, refrigerated storage, sugar factories and breweries, poultry slaughter houses and other enterprises. We have prepared 90 CEMA standards for foods and packaging materials, 56 of which were confirmed by the Permanent CEMA Commission on Standardization and are being used in practice. Also confirmed were new technologies for the production of vegetable protein, vegetable oils and antibiotics. The use of a basically new technology for the production of vegetable oil by direct extraction facilitates a far higher oil yield and the maintenance of the quality of the vegetable protein in the residue, now used to feed livestock.

Newly developed for the meat industry were new technologies and equipment for the complete mechanization and automation of labor in the slaughter houses, meat processing and waste product utilization.

The most important problems to be resolved by the sugar industry in the scope of CEMA concern the need to lower energy use in the main technological processes, reduce sugar losses in manufacture and develop and transfer to production new chemical and physical methods and automated control systems using EDP.

For the purpose of increasing protein resources, the CEMA member countries concluded a general agreement on the perfection of the existing technologies and the

development of new equipment and technical means for inland fishing. Included therein are provisions for the breeding of new kinds of fish and of hybrids, the production of new feed pellets for fish, disease prevention and fighting sickness among fish, as well as other measures.

A most topical problem of the agrarian-industrial complex is the reduction in unwarranted losses of raw materials for the food industry and finished products. Due to inadequate technical facilities for quality appropriate harvesting, processing, transportation, storage and delivery to the trade, losses of raw materials and finished products are still unduly large, far too many of the valuable nutritional substances lost. Studies have shown that losses might be reduced to one eighth to one tenth merely by providing the appropriate conditions. The resolution of this problem is of a complex and interdisciplinary nature. It is necessary, therefore, to create new technologies and highly productive equipment for the comprehensive mechanization and automation of the processes involved in harvesting, shipping and transportation, in warehousing and the sale of the foods by the wholesale and retail trade. Of the utmost importance in this context is the matter of the development and introduction of universal refrigeration at all stages of the food chain. The five-year plans on scientific-technological cooperation by the socialist countries therefore include plans for research on the most rational use of the refrigeration capacities and the development of new and efficient methods and technologies for the refrigeration and freezing of foods. Connected with this is the design and the introduction of new types of refrigeration compressor sets, refrigerated containers for food transportation, various technical means for the automatic control of temperatures and the atmosphere in fruit and vegetable warehouses, equipment for beverage cooling, refrigerated showcases for normal and extra low temperature refrigeration, and other technical devices distinguished by low energy consumption and a great deal of profit.

The realization of the measures decided upon for scientific-technological cooperation in farming and the food industry will contribute to increased production, improved quality and lower losses of agricultural produce and foods in order to guarantee the rational nutrition of the peoples in the countries of the socialist community.

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CZECHOSLOVAKIA

PARLIAMENT EVALUATES YIELDS FROM PRIVATE PLOTS

Prague ZEMEDELSKE NOVINY in Czech 23 Feb 84 p 1

[Article by (kd): "Agricultural Committees of the Parliaments of the Federal Assembly on Livestock Producers and Growers--Benefit to Individuals and Society"]

[Text] The measures adopted by the Government of the CSSR and of both republics, aimed at better exploitation of the opportunities of small producers and growers, proved successful. This was confirmed yesterday by agricultural committees of both parliaments of the Federal Assembly at their meeting in Prague, when they discussed a report on the experience in the procurement of agricultural products from private users of agricultural land. E. Cakajda, first deputy minister of agriculture of the CSSR, presented to the deputies his exposition of this topic on the agenda.

In this context the deputies reviewed with appreciation the introduction of contractual fattening of the livestock, tax exemptions for the earnings from small-scale farming operations, the opportunity to transfer uncultivated plots to the management of organizations and to individuals, and last but not least, grants of preferential loans to small producers and growers.

More Contractual Fattening

In the past years the whole complex of these measures was reflected in the reversal of the declining numerical situation of cattle, hogs and poultry in private farming. From early 1979 to the end of 1983 contracts with private producers resulted in 160,400 heads of slaughter cattle, 27,500 heads of slaughter hogs, 381,500 heads of slaughter sheep, 199,000 geese, and more than 6.6 million slaughter rabbits. In the same period the procurement of slaughter livestock amounted to over 95,000 tons of live weight, including 32,300 tons last year. At the same time, this production made no demands for investments and work forces and, furthermore, it consumed less grain fodder. Contractual production used roughly 165,000 tons of grain fodder, which is 23,000 below the norm in the socialist sector. Bulk fodders represent additional savings; for the production of the above-mentioned amount of meat cooperatives and state farms would need hay from 15,000 hectares annually.

## Deliveries To Market Are Up

In recent years private producers also increased their production of fruit, vegetables and other products for their own consumption as well as for deliveries to state funds. If, for example, their production of fruit amounted to about 337,000 tons in 1978, in 1982 it was already 530,000 tons. Private growers share 59.3 percent in the deliveries of fruit to the state funds. Their deliveries amounted to 86 percent of all plums, 73 percent of all cherries, 83 percent of all gooseberries, etc. They provided 17.7 percent of all delivered vegetables, but more than 60 percent of radishes and garlic, and 88 percent of horseradish.

## Incomes Are Also Up

This growth of production by private growers and producers is also reflected in higher incomes earned for such activities. In 1983 their incomes were up Kcs 396 million, or 10.5 percent more than in 1982. Those earnings were derived mainly from contractual fattening of the livestock and from sales of vegetables, fruit and grapes. Net proceeds, however, were substantially lower. For instance, it is estimated that for the fattening of a bull of an average weight of 50 kg the producers kept net earnings of Kcs 5,000 from the receipts of Kcs 12,500.

## Proposals of the Deputies

In the discussion several deputies offered their specific proposals for further improvement in the operations of private producers and growers. R. Rimán and J. Kalkus stressed the fact that many lots unfit for mass production are located at a distance from the towns. It should be made possible, for example, to establish there gardeners' centers--in brief, to achieve intensive exploitation of such areas. J. Kalkus spoke also about the shortcomings in the procurement of animal skins, which force many producers to discard them. He proposed that a specialized association organize processing of the skins for the producers as well as, on a larger scale, of sheep's wool. Deputy M. Plisková urged better information for the growers about the future procurement of vegetables by the Zelenina [vegetables] enterprise. Thus far the growers learn about the procurement plans only when the contracts are being signed, but at that time many kinds of vegetables have already been planted. Most of the deputies stressed also that, despite certain improvements, deficiencies continue in the supply of tools and machinery necessary for private growers and livestock producers.

The deputies formulated most of their proposals in the form of the committees' position on the presented report and in their recommendation that the minister of agriculture and food of the CSSR implement the above-mentioned proposals. The position and the decisions stemming from the discussion of the committees will also be discussed by the presidiums of both parliaments of the Federal Assembly.

CZECHOSLOVAKIA

FAULTY PLANNING HINDERS DECREASE OF DRINKING WATER CONSUMPTION

Bratislava PRAVDA in Slovak 31 Jan 84 p 4

[Article by Anna Zimaniova: "Turning the Upside Down Right Side Up--Water Management Too Calls for Concerted Efforts"]

[Text] "In all decisionmaking one must stay aware of the fact that while old mechanisms offer comfort, they can also be dangerous. The SSR Ministry of Forestry and Water Management is requesting priorities for capital construction of water management projects. Such priorities are not only justified, they are indispensable. I know that we already have many priorities, quite specific and most closely monitored construction projects. But if priority is not assigned to water, there will not be any priorities any more, that will be the end of all priorities as well as of the quality of life in this country."

There is no need to doubt the thoughts we selected from the address made by representative Vladimir Minac at the Tenth Plenum of the Slovak National Council at the end of last year. The problems with water which we have been encountering since then in succession in various forms in individual parts of Slovakia only serve to confirm his opinion. They are the result not only of long-lasting extremely detrimental hydrogeological conditions to which we often refer in trying to objectively justify the situation; it must be frankly admitted that the situation reflects the approach and attitude to dealing with tasks in water management which in the period of extensive development of our national economy became lost somewhat in the background.... However, there is no time for crying over spilled milk.

The First Paradox

The key item on the agenda of the day--economy and effectiveness--applies at the present in its full extent also to water and to the whole spectrum of activities included in water management. That objective is also pursued by SSR Government Resolution No 335/1982, which adopted measures for dealing with the situation in the drinking water supply in Slovakia. Plants of the North Slovak Water and Sewage Works enterprise in Zilina are coping with them successfully on the whole, although not without encountering problems. These problems are caused primarily by the fact that the tasks planned for water and sewage work enterprises (managed by regional national committees) are essentially in conflict with the vital societal requirement to save precious water. Simply put, obligatory indicators lead or, rather, force them to do just about the opposite.

This contradiction (discussed already last year at various levels with promises of redress) still has not changed, as we once again found out in the North Slovak Water and Sewage Works in Zilina.

The enterprise, together with the Central Slovak regional national committee and water management organizations of individual districts, adopted in the spirit of the above-mentioned resolution a whole set of measures for meeting the tasks of economizing in the management of drinking water, particularly in enterprises of the socialist sector. As a result, key bulk consumers in Northern Slovakia decreased their consumption of drinking water last year by 975,000 cubic meters in comparison with 1982. Understandably, it was on this basis that the enterprise negotiated and concluded with its individual bulk consumers written agreements regarding water supply for the current year. This represents an additional decrease in consumption by 893,000 cubic meters in comparison to last year's actual consumption. It stands witness to their solid approach to meeting the demand--saving and economizing with water--both on the side of the bulk consumers and that of the water and sewage works enterprise that bears on its shoulders the greatest onus of responsibility for meeting this task. The paradox is that very little thought was given to saving water in the compilation of the plan, which should be of decisive importance also to water and sewage works. Namely, the generation and distribution in the current year of 61,450 cubic meters of water (water billed to households, small and bulk consumers), which actually represents an increase of 2.8 million cubic meters, i.e., 4.7 percent over last year's plan, is envisioned. It is true that there will be a need for supplying drinking water to 6,000 new apartments with approximately 20,000 residents. That will increase the amount of water billed to households from 33,740,000 cubic meters in 1983 to 34,800,000 cubic meters in 1984. However, when we subtract this planned volume from the total volume of billed water we find that the enterprise should supply to enterprises of the socialist sector 1,790,000 cubic meters of water more than last year, which represents a 7.2 percent increase, meaning that all the efforts and toil exerted last year toward cutting down water consumptions are gone with the water under the bridge. This extraordinary increase comes into conflict with the measures promulgated by SSR Government Resolution No 335/1982, while not even corresponding to the actual needs of the individual bulk consumers. Thus, in view of the already adopted and implemented measures ensuing from the governmental resolution, in production enterprises this increase in the plan for consumption of drinking water is less than realistic!

As a result, through all this water and sewage works are encountering considerable problems, because billed water is one of the basic sources of receipts and generation of profit for the enterprise. Generation (involving mainly processing) and distribution of the planned volume of drinking water still could be managed, but to whom could it be sold? How are they to materialize the expended resources and the expended direct labor input that goes into generation and distribution of water when it is primarily the bulk consumers who embarked, and correctly so, on a path of economizing to which they are also led by economic stimuli? These are questions that could be asked in water and sewage work enterprises, because for them, as for any other enterprise, what counts is meeting the obligatory plan indicators. Nevertheless, from the viewpoint of societal economizing and effectiveness, even more important would be an answer to

the question of how it is possible that enterprises that bear the term "water" in their very title and are actually coordinators of its generation are not provided with any material incentives toward its savings, economic and effective utilization and, on the contrary, that anything they do in the name of such economizing ultimately turns against them.

### The Second Paradox

The problem also has its reverse side. Billed water--an obligatory plan indicator--represents receipts for the enterprise. So does another indicator--repair and maintenance. But there is the catch! Only for work performed by the enterprise for others. Thus, if it wants to, e.g., in the current year meet the plan of earnings--endangered, as already mentioned, by lack of receipts for the billed water stipulated by the plan--attention will be focused in water and sewage works on construction and installation operations for others. Maintenance of waterwork and sewage facilities--which belongs among the basic obligations of water and sewage works and whose unsatisfactory technical condition virtually calls for systematic attention--will eventually get what it is due, but--and that is another paradox--only if permitted by the plan. Thus, it is no wonder that from the attained outputs of construction and installation operations in SSR water and sewage work organizations, which in 1982 amounted to Kcs 151.4, only Kcs 36.7 went to repair of their own long-term assets. These do not improve the economic result achieved by the organization, so that attention naturally becomes focused also on tasks that promote meeting of tasks prescribed by the plan. Nevertheless, the interest of the society as a whole in lowering the consumption of water, reducing the losses in water mains, improving the quality of water supply, etc., is permanently left out. It appears--and current experience bears this out--that the apolitically economic stimuli that were placed upside down in their application to water and sewage work organizations must be placed right side up, to bring them into harmony with the needs of the society as a whole.

### Recognizing the Importance of Water Means....

We do not claim to be breaking any news in stating our opinion that economizing with water calls for the creation of not only political-economic, but also the requisite technological conditions. Their basis is capital construction, its systematic and timely implementation. The North Slovak Water and Sewage Works that we visited in Zilina has been carrying out this task for many years. It met the plan of capital construction in the Sixth 5-Year Plan by 109.8 percent, which represents Kcs 649.5 million, and for the 3 years of the Seventh 5-Year Plan it met it by 110.3 percent. We do not point out the results attained in capital construction just by accident, and reference to the results achieved in the Sixth 5-Year Plan is also not merely accidental. The readiness, technological level and operational facilities of waterworks are always the result of long-term systematic efforts in which, figuratively speaking, one brick is laid next to another to make up a complete structure well prepared to meet the constantly more demanding qualitative tasks of water management. It is said about the North Slovak Waterworks personnel that their enterprise is the best among its Slovak sister enterprises, even though they have to tackle the same problem in production. Nevertheless, it is true that they manage to find

solutions somehow more easily and, what counts, apply them in practice more expediently. How come? "I, for my part,"--plant manager Eng Jan Lazur told us,--"think that it is the result of many years of close cooperation with the Central Slovak regional national committee, whose highly qualified personnel have been approaching all problems pertaining to water seriously and with full responsibility ever since our enterprise was established, i.e., since 1972. Our joint cooperation is not just of 1 or 2 years' standing when water became a more frequent and serious topic. Finding constant understanding and always finding help from our superior organ when it is needed in dealing with considerable problems means being halfway to success."

From the plant management we heard quite a few comments to the effect that "for our director there is no such thing as a task that cannot be accomplished and that is what he is trying to impart to us as well."

Both answers reveal the basic feature of the nature of work and the approach to carrying out the tasks of water management not only on the part of the plant but also on the part of its superior organ: correct perception of the significance and importance of water as one of the basic prerequisites of human existence, which at the same time represents an irreplaceable raw material for production. However, from the viewpoint of society as a whole it is important that this correct perception of the significance of water also be shared by higher, mainly central planning organs.

8204  
CSO: 2400/216

CZECHOSLOVAKIA

MEETINGS AT UNIFIED AGRICULTURAL COOPERATIVES SET TASKS FOR AGRICULTURE

Prague RUDE PRAVO in Czech 30 Jan 84 p 1

[Text] On Saturday the decrees of the Presidium of the Central Committee of the Czechoslovak Communist Party, the Government of the CSSR and the Central Committee of the Popular Front of the CSSR were published. They are designed for the 10th Congress of Unified Agricultural Cooperatives, which will take place from 29 November till 1 December 1984. This will be a significant event for our socialist agriculture. Cooperative members will hold deliberative sessions at the time of the 40th anniversary of that glorious turning point in our struggles, when our peoples became free and our land was set free by the Soviet Army. The congress will evaluate what has been accomplished in the 35 years since the establishment of the first unified agricultural cooperatives. In addition, it will review the results that we have achieved and the experience that we have gained up until now from the building of socialist agriculture and the completion of seven 5-year plans. Wide-ranging discussions will take place in preparation for this congress. These preliminary discussions will be a part of the annual membership meetings of the unified agricultural cooperatives, which will take place in February and the first half of March.

The deliberative session, which takes place each year among the workers at individual agricultural cooperatives, is directed toward the upgrading of the work accomplished and the results already achieved; at this session also suggestions and comments by members of cooperatives about economic procedures for socialist agriculture are taken up. The significance of this year's annual meetings is therefore increased by the fact that they also represent a preparatory forum for the 10th Congress of Unified Agricultural Cooperatives.

Deliberations about production and meetings of allied and separate committees of the Union of Cooperative Farmers precede the annual meetings. They should enhance the preparation of the annual report with all the stimulating and critical remarks of the workers from individual centers, farms and homesteads. It is important for the members of the board of a cooperative to take part in discussions about production with qualified economic technicians and that they together with members of working collectives review the results of production for the past year. Indeed, a detailed examination of a balance sheet can help in many ways to formulate useful discussion of the tasks for this year's plan.

The gradual enlarging of unified agricultural cooperatives by their consolidation into large aggregates in the light of distinct economic advantages also introduced some less favorable phenomena, among which in the first place must be

mentioned the weakening of the role of the annual membership meetings, at which it has not been possible to ensure the participation of all members. For this reason, after the experiences of the past years, measures have been taken to rectify past defects especially in the preparation of annual meetings. In several of the past years we have succeeded in imprinting upon these annual meetings a working character, and it is necessary to deepen this impression even more this year. This is particularly important with regard to new undertakings.

The purpose of the deliberations about production, which precede the annual meetings, is to discuss not only results that have been achieved, but above all methods of how and where to increase the quality and effectiveness of work, what plans to use in order to promote the further development of initiative in the workplace and to encourage socialist pledges which express the joint responsibility of individual members for the overall results of a collective economy. From deliberations about production there should likewise arise proposals for political and organizational measures which bring together suggestions initiated by the discussion among all cooperative members. It is a question above all of seeing to it that the knowledge of the members of the unified agricultural cooperatives significantly advances the efforts to fulfill this year's tasks as well as possible; that knowledge should also help in implementing an improved system of planned management in agriculture and finding new directions for the social and economic development of our socialist agriculture.

The annual meetings of the unified agricultural cooperatives are assemblies at which the basic tasks of production as well as economic and social goals are spelled out and resolved. They represent one of the ways in which the principles of cooperative democracy are put into practice.

In the last 10 years unified agricultural cooperatives in our country have proved that they can conspicuously increase their efforts in the area of agricultural production. In the proclamation emphasis is placed upon those things to which attention needs to be directed. However, it is not always possible to express satisfaction with the results so far attained, especially with what has occurred in the diversification of animal and vegetable production; it has led to bad results in vegetable production. This was not always simply the result of depending on an assurance of sufficient fodder from imports, but also of various failures in agricultural technology, such as too great a reliance upon the effectiveness of weed-killing methods, industrial fertilizers and so on. There was not even a satisfactory level of attention paid to good use of the soil, or to an increase in its fertility, or to an assurance of sufficient fodder from domestic sources in proportion to the needs of live-stock production.

In addition, it is necessary above all to do some hard thinking at those sessions concerning production, which precede the annual meetings of the unified agricultural cooperatives. Their agenda must be aimed chiefly at increasing the self-sufficiency of domestic supplies, and that means the production of grain and fodder. It is no longer possible to rely upon the assistance of allotments from state funds supplemented by costly imports from

abroad. For this reason it is necessary to put much more effort into the program of increased self-sufficiency in the production of grain and fodder; more businesslike methods and accountability must be brought to bear in ensuring the sound application of agricultural technology, profitable harvests and the stockpiling of all agricultural produce. Only in this way will it be possible to advance the further development of our agriculture and gradually to create self-sufficiency in the ensuring of fodder from domestic sources.

It is necessary to make headway in the intensification of agricultural production. This will be another of the main topics on the agenda of the annual meetings and before this of the sessions on productivity. Together with questions of intensification it is, however, essential to work on the problems of lowering the costs of production, making better use of all the means available, and managing fuel oil and other sources of energy more economically.

The point of departure for preparation of the annual meetings are the explicit conclusions of the 16th Congress of the Czechoslovak Communist Party and the 4th and 9th sessions of the Central Committee. Even if the 10th Congress of Unified Agricultural Cooperatives declares itself unanimously in favor of the fulfillment of the adopted decrees, it is desirable in cooperatives and individual workplaces to consider how much the efforts of the members have contributed to them in the sessions on productivity, and at separate and annual meetings. And this shows the necessity of imbuing the above-mentioned discussions with a genuinely working spirit. At the meetings of the boards of directors of cooperatives, representatives from cooperative plants and those run by managers, and from institutions and organizations of employees will have their opportunity to speak in early spring. And such a meeting is necessary in order to direct the discussion toward practical questions of cooperation.

In both the preparation and in the course of our annual meetings, and then in the discussions prior to the congress, those members who are also communists must play a conspicuous role. Their party qualifications oblige them to approach the deliberations in a critical spirit and to make self-criticism a part of the discussions. In addition, they should point out the possibilities and provisions for the further improvement of collective management, the increasing of thrift, the more intensive and effective use of all resources, and the abolition of differences in the management of individual centers. Likewise, they must stimulate more effective use of scientific knowledge and research in the quest for an intensification of agricultural production.

The annual membership meetings of the unified agricultural cooperatives will be taking place under the auspices of the 35th Annual Historical Congress of the Czech Communist Party, which has laid out the general lines for the building of socialism. Since that time agriculture in our country has had many significant successes. Not only has the nature of production changed, but also the way of life in the villages. However, it is necessary to link up all our successes to the prosperity of our society as a whole.

These thoughts are emphasized in the decree, which applies to all those involved in agriculture, to the workers at the state farms, at the machine and tractor service stations and other organizations of employees so that with their suggestions, their comments and their initiative at the workplace they can help not only to deepen these discussions, but also to indicate new paths for the development of our socialist agriculture.

GERMAN DEMOCRATIC REPUBLIC

DECREE ON ORDER, DELIVERY TIMES OF MATERIALS EXPLAINED

East Berlin PRESSE-INFORMATIONEN in German No 14, 2 Feb 84 pp 2-3

/Interview with M. Flegel, deputy chairman, Council of Ministers, and chairman, State Contract Court: "In the Interest of Greater Flexibility in the National Economy"<sup>7</sup>

/Text/ PRESSE-INFORMATIONEN: What is the concern of the new "Decree on Order and Delivery Terms for Raw Materials and Other Materials as well as Component Products"?

Flegel: Consonant with the nature of democratic centralism, cooperation among enterprises and combines in our socialist planned economy is primarily--though not exclusively--decided by the plan. The economic plan and its balances establish the tasks for all in a mandatory manner. However, it is up to the enterprises' and combines' own responsibility how they cooperate in carrying out these tasks. They do so by the conclusion of business contracts. These include all agreements required to implement the state plans, beginning with the precise type and quantity of the products to be supplied, the delivery date and the price--up to and including such indispensable details as packaging and routing. This means that the results of the economic strategy for the 1980's, resolved upon by the Tenth SED Congress, largely depend on the enterprises' and combines' success in utilizing business contracts to steadily more efficiently organize their cooperation in the accomplishment of plan tasks.

It is the concern of the new "Decree on Order and Delivery Terms for Raw Materials and Other Materials as well as Component Products" (GB1 Part I No 2 of 26 January 1984) so to regulate important terms of this cooperation, that they may respond to the demands arising from the progressive conversion of the national economy to intensively expanded reproduction. In its scope, the decree thereby responds to the task, set by Erich Honecker in his directive address to the Seventh SED CC Plenum, to assign a comprehensive meaning to the process of intensification oriented to guarantee the unity of economic and social policy and to safeguard stable bases for its long-range evolution.

PRESSE-INFORMATIONEN: How does the necessity arise for reorganizing the style of ordering, delivery and contract conclusion for raw materials and other materials as well as component products?

Flegel: The national economy's conversion to intensification is linked to a significant increase in the dynamism of the course of the economy. While, for example, the product assortment of machine construction used to be renewed every 10-12 years, it is now necessary to replace the items in production by new products every 3-4 years--if we wish to keep pace with international developments. The situation is similar with regard to production equipment. At the same time changes occur on foreign markets, and often neither their tendency nor dimensions are foreseeable. This calls for a fast response to the developing demand and for new efficiency reserves.

Keeping all this in mind, we began last year to adopt measures for improving the flexibility of planning and balancing. Our socialist planned economy must quickly react to all changes, and we therefore need greater flexibility in the organization and fulfillment of business contracts. As the final producers' ability to react depends largely (and in all sectors of the economy) on the time needed by their suppliers to fill the orders placed with them, cuts in the order and delivery times for raw materials and other materials as well as component products represent a priority problem. The existing order and delivery times, governed by former proven kinds and methods of cooperation among enterprises and combines, no longer meet the needs of our present socialist planned economy. It was therefore necessary to legally reorganize the issues involved.

PRESSE-INFORMATIONEN: What is the essential purport of the new regulation?

Flegel: Consonant with the requirements of national and enterprise planning, the annual orders for raw materials, other materials and component products will in future also have to be placed well before the beginning of the plan year and the respective annual contracts concluded. One of the new regulations specifies that customers have the right not to place their annual orders until such times as they themselves receive their state targets for the coming plan year. The main novelty is the provision that, in contrast to the former procedure, annual orders and annual contracts need no longer be broken down to each individual item but only to the headings of the product and services nomenclature. The further itemization of the annual contracts concluded on the basis of the orders proceeds quarterly in accordance with the rules in effect for planning and balancing, actually always 3 months before the beginning of the agreed delivery quarter.

These regulations cut the former order times by about two thirds. The customers therefore enjoy far better contract opportunities. This makes it possible for them to develop major reserves for plan implementation. In some enterprises, for example, stocks of components supplied by the metal processing industry tend temporarily to be smaller than planned. At the same time other consumers hold considerable excess stocks of these same items, often as the result of erroneous need estimates.

We have learned that consumers are now generally able on the dates regulated in the decree to accurately decide their requirements with regard to the precise assortment and delivery date. Moreover, they are entitled to place orders even after expiry of these dates. The short-term classification of new orders often involves greater costs for the supplier. It has therefore been decided that the partners may agree an up to 12 percent price surcharge in such cases.

PRESSE-INFORMATIONEN: Does the decree apply equally to all raw materials, other materials and component products?

Flegel: The decree applies without exception to all products of this kind within the scope stated. Of course it does also take into account the fact that reproduction conditions vary in the various sectors. Delivering combines and their customers may, for example, agree that it is necessary in greater detail to subdivide the rough assortment usually adequate for placing the annual orders and concluding the annual contracts, because this is required in view of the special features of some industries. Furthermore, balance responsible ministers are authorized to issue supply orders specifying other divergences from the order and delivery times settled in the decree. Such divergences may also be agreed by coordination contracts between individual combines. The general assumption here is the admissibility of divergence from the rules of the decree only if the specific reproduction conditions objectively call for such divergence.

PRESSE-INFORMATIONEN: When will the decree take effect?

Flegel: The enforcement of the provisions of the decree requires changes in operational organization and, sometimes, also in production technology. The decree for ordinary products takes effect on 1 February 1984. Most orders by far for this year have already been placed. This means that the new regulations for products of this kind will largely become effective for orders to be delivered in 1985. The decree takes effect on 1 January 1985 for blueprint dependent components. The time available up to then should be responsibly used by all enterprises and combines.

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GERMAN DEMOCRATIC REPUBLIC

DESIGN TO PLAY LARGER ROLE IN COMBINE MARKET STRATEGY

Neubrandenburg FREIE ERDE in German 28 Feb 84 p 4

[Article by Dr R. Woderich: "The Toboggan or the Question of Design"]

[Text] On Friday still, while comfortably sitting together and discussing the topics of the week, a colleague said: "What is the point of this? Design in our newspaper? But that has no meaning in our bezirk, has it?"

Maybe he thought of farm products. They indeed need no design efforts. Either they are formed by nature (and I do know that cube-type tomatoes have been grown) or are of an amorphous mass without hardly any structural features. Yet when one comes to the foodstuffs industry, the picture changes. Containers, packaging, labels, even the forms of the product provide aesthetic values and have an effect on how and whether the products are selling on the market.

At the '84 Design Forum of the Industrial Design Office (Amt fuer Industrielle Formgestaltung, AIF) in Berlin several examples were cited for how, in particular, new ways of packaging helped achieve export success. A sharp wind is blowing on the world markets, as one knows. Capitalist corporations also seek to meet the crisis through putting enormous pressure on the product renewal rate and through sophisticated market strategies directed especially against products from socialist countries. So design policy becomes a vital question that largely controls the weal and woe of our products on those markets.

Higher efficiency through new technologies and new products. That way Erich Honecker, at the seventh Central Committee session, described the step ahead of us in the implementation of our economic strategy. Said he: "For that we mobilize our republic's intellectual and material potential."

Innovation is trump, that is the motto of this year's forum, "Innovation and Design," not by coincidence. Ideas are wanted, creative attitudes, imagination, a desire to upgrade, a joy in taking risks--all that which through new products leads to higher efficiency. "Crazy ideas pay off more and more," says Prof Werner Gilde of ZIS [Central Institute for Welding Technology] in the paper he gave at the session. "And if one knows much about what one knows nothing about, there is a great likelihood that inventions are made." But ideas are not what we are short of, many enterprises say, the capacities is what we do not have. Yet when they inquire into ideas there, the ministries often run into flaws.

Yet nonmaterial achievements are what enterprises are expected to offer more and more--that is the international trend: sketches, projects, service, customer advice (software in the broader sense).

Working with ideas thus is ongoing, must never stand still. Internationally it is being regarded as a perfectly satisfactory yield if 10 percent of the ideas around will become effective in production. Working with ideas, for all that, must be learned and practiced. That holds true for technical inventors as well as designers. New requirements and training methods at the industrial design college played a prominent role therefore in the discussions in all working teams.

An example: A traditional task for designers may have been to come up with a new toboggan. That will no longer do. The question itself must be reformulated: Which new toys can be created for the winter? After all, one wants products that are in demand, satisfy various needs, and come at high quality.

Finally, the crucial question is provoked: Where are we in the GDR in design development? The forum's working team A (technical consumer goods) had settled for the formula: "We are as good as our show windows demonstrate we are." Sure enough, that still leaves some openings but clearly indicates the direction: The measure of things can only be what is available in ordinary life. Also in our culture of products we can consider accomplished only what, to quote Lenin, "has entered ordinary life, habitual living."

In many combines' market strategy the place value of design often is not yet up to par. What matters today and for the future is to form one's own attitudes and positions, not to run behind international trends but to codetermine them decisively. High market profits are possible only through good design. And more than that: Design must preside over a combine's visibility. The incisiveness, impressiveness, originality of a design (ZIS is a model in this too) ensure permanent successful sales. That way alone can quality work from the GDR become a trademark for our capability. The 10th party congress standards were up there precisely.

Design needs more publicity, the designers need more public recognition. That also places high demands on the designer himself: Steadiness and self-assurance, extensive economic and technical knowledge, and finally, the ability to express himself accurately and clearly when talking with other partners (a general problem in interdisciplinary efforts), for the "burden of proof always lies with the inventor" (Werner Gilde). The burden of the responsibility for the design, however, ultimately lies with the enterprise managers.

State Secretary Marin Kelm, in his concluding speech, referred to our having to surmount many ideological barriers. That design was premature, extra expense, and inhibited by some objective circumstances were arguments that could no longer be tolerated. Now precisely the matter was to get an optimum out of every gram, every pfennig, every minute, and high product refinement was not longer conceivable without high-grade form quality.

I hope I could convince my colleague. He may even be glad to learn that AIF has made a video film of the '84 Design Forum as a visual aid for educational purposes.

The bezirk town plays a lead in it. In form of a model design solution, the city furniture program for Neubrandenburg which, despite all those who had their doubts, is being inserted, step by step, into our city image, a piece of exemplary aesthetics in our everyday life.

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GERMAN DEMOCRATIC REPUBLIC

ELBE RIVER, WASTE WATER, SLUDGE SOURCES OF IRRIGATION

East Berlin WASSERWIRTSCHAFT-WASSERTECHNIK in German No 2, Feb 84 pp 26-28

[Interview with M. Simon, WWT advisory council member and director of Water Management Administration, Lower Elbe: "Making Still Better Use of Water Reserves"]

[Text] WWT [WASSERWIRTSCHAFT-WASSERTECHNIK]: The Seventh Conference of the SED Central Committee also took up the expansion of irrigation--a project which is supposed to help achieve high and steady yields in agriculture.

A look back at the year 1983 enables both farmers and water industry personnel to observe the following: On irrigated surfaces, it was possible to harvest 25-30 percent more than on unirrigated surfaces.

The following question is timely as far as the plan year of 1984 is concerned: Are there still any reserves in order to get a stronger grip on irrigation as an intensification factor?

M. Simon: We must and can help open up water reserves for agriculture, for gardens, and individual areas. We do have available a comprehensive program for the extension of the existing 120,158-hectare irrigation surface (including 51,876 hectares of sprinkler area) in Magdeburg Bezirk whose construction has already been started.

For the year 1984, we have planned giving preferential treatment to 28,045 hectares, of which 20,635 hectares are real increase while effective irrigation is to be guaranteed on 7,410 hectares through reconstruction measures.

We water industry people in the bezirk have made a rather essential contribution to the development of this program. The base organizations of the SED at WWD [water management directorate] headquarters, the river sectors, and the Bode TSM [expansion unknown] made specific determinations in their fighting program in November 1983 for the purpose of carrying out the irrigation program and to check on the measures that were spelled out.

When it comes to increasing the irrigation surfaces, we are primarily concerned with the better utilization of existing weirs, reservoirs, fountains, ponds, lakes, and running water bodies as well as the application of simple irrigation methods which are to be carried out primarily through the mass initiative of the village population.

All measures are intended solely to serve the goal of tapping all water reserves in order thus to achieve higher yields from the agricultural utilization areas, especially in the case of root crops, fodder, fruit, and vegetables.

WWT: As far as we know, Magdeburg Bezirk is one of the bezirks in the GDR which is poorest in water. Here it is certainly important to make particularly effective use of water.

M. Simon: Indeed, as far as the water supply is concerned, Magdeburg Bezirk is below the GDR average due to the fact that large parts of the bezirk are located on the rainless side of the Harz Mountains. In view of this we can also understand that, out of the 736,808 hectares of agricultural utilization area, 640,000 hectares, in other words 86.9 percent, require irrigation. Out of the water supply in our bezirk during the dry month of August, which is 60 million cubic meters, so far only 36 million cubic meters are being used for agricultural irrigation. This water volume is used up, that is to say, it never returns to the water cycle. The supply of surface water in Magdeburg Bezirk--except for the Elbe [River]--is mostly exhausted. Taking additional water from the flowing wave of these water bodies is possible only to a limited degree.

WWT: Is it at all still possible to tap additional water reserves under these complicated water situation conditions?

M. Simon: Absolutely. First of all through the consistent application of efficient water use in all sectors of the national economy according to the "Direktive zur rationellen Wasserverwendung" [Directive on Efficient Water Use]. In the autumn of 1983, for example, during the hearings on industry's activity plans for efficient water use for the year 1984, it was possible to prove that the water requirement would be reduced by another 23 million cubic meters by the year 1985. That would be 16 million cubic meters more than planned. The water volume thus released can be made available additionally and proportionally to agriculture during the vegetation period.

Moreover, agriculture can naturally make its contribution to efficient water use through disciplined application of EDP sprinkling consultation and further connection of sprinkling surfaces to EDP sprinkling consultation. Here, the multishift operation of the sprinkler installations and priority sprinkling during evening and night-time hours play an essential role.

Furthermore, maximum utilization of water from the Elbe which does not as yet reveal a balanced deficit--is possible for agricultural irrigation, either through direct intake from the Elbe, through water piping from the Elbe or through the utilization of many old arms and gravel pits in the Elbe depression as well as by taking out underground water near the Elbe.

We furthermore want to retain more water than so far during the winter months, with their large flowoff volumes, in lakes, ponds, small reservoirs, and by means of dams. In this connection we must carry out a comprehensive program for the reconstruction of existing facilities and the erection of new ones.

Many communities are planning to dredge mud out of the village ponds in order to get a larger reservoir capacity or to make use of the nutrient-rich mud. Repairs and alterations are made on numerous weirs with respect to sluice boards and piers in order to eliminate any leaks and to store more water.

An additional storage capacity of 195,000 cubic meters is being created in Havelberg Kreis by means of banking-up three lakes. New dams are being erected primarily through simple construction methods in all kreises in agricultural and water-industry main ditches.

In connection with all of these measures, personnel from the WWD will support the local agencies in word and deed and help the village population in implementing these simple measures.

By means of reconstruction measures on 61 weirs of the WWD as well as the further expansion of a reservoir in the Biese section, 2,717 hectares are to be irrigated in a steady fashion and an increase of 340 hectares of irrigation surface is also to be achieved in this connection.

The WWD teams are also doing repair work on their own, on 110 weirs worth M300,000. This will benefit an area of 1,670 hectares. Of this number, 34 weirs, with a benefit area of 450 hectares will be rebuilt by the elections in May 1984; the other installations will be completed by the 35th anniversary of the republic's founding. Many sluice boards will be repaired in the river sector workshops in December and January.

WWT: What role do you assign to the dam advisory boards in this connection? Should they not develop a special initiative in carrying out the irrigation program?

M. Simon: Certainly. The dam advisory boards must guarantee the optimum operation of all weir installations to achieve the maximum possible effect for dam-based irrigation. During dry autumn and winter months, such as those we are having now, we also need orderly dam operation so that we can achieve the largest possible filling level of underground water storage capacities in the soil during the spring months, prior to the start of the irrigation period. The dam advisory boards should pay attention to this in all communities and kreises during the preparations for the 1984 irrigation term.

Because of the tight water balance situation, the above-kreis dam advisory boards are of special importance in the river regions of the Ohre, the Tanger, Grosser Graben, as well the Uchte and the Biese, in order to be able to make adequate volumes of water available to crops that require irrigation also when certain water supply stages are ordered.

WWT: And what about the construction of new reservoirs and dam installations? Does this not also come under the irrigation program? And will this not above all be a task for the WWD?

M. Simon: As a priority matter, however, we want to support the local initiatives, that is to say, we want to contribute to effective irrigation

with simple means, whereby we must use above all also the lessons learned by agricultural and water industry personnel residing in the communities.

In addition we will also build new reservoirs and dam installations so as to expand the irrigation effort further. In this connection the people's representatives in the communities and the bezirk council have already adopted the corresponding resolutions. The project managers here are the community of Wallstawe in Salzwedel Kreis, the community of Rosian in Zerbst Kreis, and the community of Gross Garz in Osterburg Kreis, which also serve as consultation points and guidance centers for the rapid generalization of lessons learned. For example, the Rosian community will enlarge its small reservoir by 20,000 cubic meters and the reservoir in Isterbies will be enlarged by 10,000 cubic meters; three new dams are also being built there.

A waste water sprinkling system for domestic and dairy waste water covering an area of 200 hectares and five new dams are being erected in the community of Wallstawe.

The community of Gross Garz will dredge the mud out of Lake Gerich in order thus to create an additional 15,000 cubic meters of reservoir space and to make use of the fertile mud on the humus-poor sandy soil. Furthermore, two new fountains are being drilled for 100 hectares of irrigation surface and another ten fountains are being started for kitchen-garden developments. All of these measures will have been completed by the irrigation period of 1984. Our WWD will contribute to the further expansion of the irrigation surface by 2,500 hectares through the erection of 58 new dams in 1984. By the time the people's elections roll around, eight weirs with a benefit surface of 635 hectares and, by the end of 1984, another 50 weirs and reservoirs of the Biese with a benefit surface of 1,865 hectares will be completed.

But before new reservoirs can be built, we must make more intensive use of the existing ones. By using modern storage methods, we can, starting in 1984, make 104,000 cubic meters more water available from the pond in Castle Flechting and 720,000 cubic meters more water via the underground water drainage system from Lake Arend.

For additional favorable dam possibilities, we are currently conducting specific studies at 16 sites for small reservoirs with a possible total storage space of 5.3 million cubic meters.

By the people's elections, the water transfer pipeline from the Elbe, covering an area of 4,700 hectares, will have been completed by the WWD and will be ready for operation.

WWT: What do you think of the increased use of waste water for irrigation? Is this not also a big reserve to supply plants with nutrients?

M. Simon: You have touched on an important factor here. The irrigation of agricultural utilization areas with waste water will pay off for two different reasons: First of all, the nutrient-rich waste water is used for agricultural

purposes. Because of that, it is possible to achieve an additional yield of 1.5 grain units per hectare, compared to clear-water sprinkling, according to investigations conducted by the Muencheberg Soil Fertility Research Center. Besides, we can thus make an essential contribution to keeping the water bodies clean. The purification effect deriving from the soil and the plant in case of nitrogen and phosphorus can be as much as 97 percent and in the case of the decay of the organic charge (BSB<sub>5</sub>) it can be as much as 98 percent. In the future we should also pay more attention to the increased use of settling sludge, including wet-sludge sprinkling. Naturally, waste water for irrigation purposes should be used primarily for green land and for fodder land.

As of now, waste water volumes from ten settling plants of the VEB, WAB [water supply and waste water treatment plant] in the bezirk are being used for agricultural purposes; 136,000 cubic meters per day are being supplied to 6,700 hectares of agricultural utilization area.

In 1984, another 16,500 cubic meters per day of waste water from the VEB WAB and 6,400 cubic meters per day of suitable waste water from industry are to be used for agricultural purposes.

WWT: Sometimes we hear the demand to the effect that the water industry should make more underground water available for irrigation because then the irrigation problem would be solved.

M. Simon: The utilization of underground water supplies must be reserved primarily for drinking water supply. In this connection we must also guarantee the long-range requirement. This is why the utilization of underground water supplies for agricultural irrigation can be permitted only to a limited extent. As of now, 3,750 hectares are being sprinkled with 42,000 cubic meters per day of underground water in the bezirk. As regards the expansion of agricultural sprinkling, underground water supplies were explored and confirmed for sprinkling purposes at ten sites in the bezirk with a volume of 122,508 cubic meters per day. This means that an additional 16,729 hectares can be sprinkled.

Above and beyond this documented underground water supply, one cannot make any further major underground water tappings on account of the tight water balance in the bezirk. But underground water taps continue to be possible in the kitchen-garden developments of the VKSK [Union of Small Gardeners, Settlers, and Small Livestock Breeders] and in weekend home developments because of the small volume and the regional distribution--that is to say, in those cases where hydrogeological conditions so permit.

We are primarily concerned here with making sure that the 792 kitchen-garden developments in the bezirk will be completely supplied with water and that the 321 kitchen-garden developments, which are being supplied by the public drinking water network of the VEB WAB, will gradually be converted to in-house water supply.

In addition to the erection of new fountains, closed small-scale water works with a total capacity of 3,000 cubic meters per day and twelve fountains, that are no longer in use, with a total capacity of 3,900 cubic meters per day, belonging to the VEB WAB are being transferred to the VKSK for irrigation use.

WWT: One last question: Have you already sat down at a table with representatives of agriculture or the local agencies and discussed how the irrigation program can be carried out together?

M. Simon: We have had many years of good cooperation between the personnel of the WWD and the representatives of agriculture. In drafting the irrigation program, we discussed the required measures together in conjunction with the people's representatives from the cities and communities. Between two and four staff members from the WWD and the VEB WAB were appointed for each kreis as permanent partners who were available not only during the drafting of the program as such but who also handle the technical counselling and guidance connected with the implementation of mass initiative measures.

I personally cooperate in the bezirk's working staff and my deputy works in the bezirk's coordination staff. I have assigned leading staff members from the WWD or the river sectors to work out management examples for the bezirk and each river sector has its own irrigation youth project.

The staff members from the Government Water Inspectorate are constantly available with advice and actively cooperate in the water balance working groups of the kreises. Applications for water law hearings were processed without any red tape and on short notice.

The staff members from the water construction technical group of the Magdeburg operations division of the Water Industry Planning VEB by January had already worked out all project documentation for the 58 weirs and the site discussions had almost been completed by that date for all weir locations. On 31 January 1984 it was therefore possible to complete three new weirs.

In their competition program, the staff members of the Lower Elbe WWD set themselves high goals in honor of the May 1984 people's elections and the 35th anniversary of the republic's founding in order to help carry out the entire irrigation program.

WWT: We want to thank you for this interview, Comrade Simon, and we wish you further success in the execution of the irrigation program.

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CSO: 2300/349

HUNGARY

MINISTER DESCRIBES 1983 FOREIGN TRADE RESULTS

Budapest HETI VILAGGAZDASAG in Hungarian No 7, 18 Feb 84 p 4-5

[Report: "Hungarian Foreign Trade--Pluses and Minuses"]

[Text] A year full of struggle but with promising results--this is how Peter Veress, Minister of Foreign Trade, characterized 1983 in his press report of last week. Full of struggle, because the exchange rates in the Hungarian economy further deteriorated--resulting in a loss of 180 million dollars and 190 million rubles--and, in addition, because demand on the capitalist market has not significantly increased, especially not on the markets and in products that are important to us, and because on the domestic scene we reckoned with the implementation of the plan of industrial and agricultural production, but the processing industry as a whole was unable to fulfill its export obligations and agriculture was stricken by one of the century's worst draughts. On the other hand, 1983 was successful in that the export surplus in dollar-based trade was larger than that of the previous year.

Economic cooperation with the other socialist countries continues to be fundamental for the Hungarian national economy. Accordingly, ruble-based exports in 1983 exceeded the plan by 2.4 percent, which is an increase of 13 percent in value and 8 percent in volume.

Ruble-based imports exceeded the plan in 1983 by 5 percent, which is an increase of 10 percent in value and 2 percent in volume. Prices continue to be unfavorable for the Hungarian economy. Last year, too, the quality of exported goods did not increase as much as the quality of imported goods and, consequently, the same volume of imported goods required an increase of exports that corresponded to 190 million rubles or almost 5 billion forints.

Barter with the Soviet Union is decisive for the Hungarian economy: it constitutes 60 percent of ruble-based trade and 34 percent of the entire Hungarian foreign trade. Hungarian-Soviet trade increased last year by 16 percent in current prices, approaching 8 billion rubles. The annual barter agreements were fulfilled to almost 100 percent by both partners. More than half of Hungarian exports consisted of machine industry tools and equipment but the volume of chemical industry and food industry products was also significant. In the imports, raw materials and fuels continued to be on the top of the list.

However, delivery of the goods--especially in the exports--was not steady, for a disproportionately large part of them were done in the 3rd and 4th quarters. Hungarian manufacturers could not contract to make larger deliveries in the 1st and 2nd quarters, for they had still significant obligations carried over from the previous year. The quality of exported Hungarian products was generally good although sometimes they did not meet the quality specified in the contracts. This is one reason why the Soviet consumers' opinion of Hungarian light industrial products has not been as high lately.

#### Balance of Foreign Trade

Year	<u>Ruble Accounts</u>		<u>Non-ruble Accounts</u>		<u>Total</u> <u>million</u> <u>forints</u>
	<u>million</u> <u>rubles</u>	<u>million</u> <u>forints</u>	<u>million</u> <u>dollars</u>	<u>million</u> <u>forints</u>	
<b>Balance in contract prices</b>					
1979	-372.6	-12,197.2	- 91.2	- 3,562.9	-15,760.1
1980	-506.0	-14,331.0	+221.9	+ 6,755.7	- 7,575.3
1981	-362.9	-10,245.3	+258.6	+ 8,519.8	- 1,725.5
1982	-567.5	-15,053.1	+733.4	+27,654.4	+12,600.7
1983	-434.4	-11,627.5	+817.0	+34,583.3	+22,955.8
<b>Balance based on actual delivery payments</b>					
1979	-451.4	-14,709.5	-280.0	-10,278.3	-24,997.8
1980	-611.8	-17,262.3	- 14.6	- 913.5	-18,175.8
1981	-501.3	-13,952.2	+ 42.2	+ 1,075.2	-12,877.0
1982	-692.4	-18,300.7	+516.9	+19,681.2	+ 1,380.5
1983	-549.1	-14,608.8	+658.9	+27,794.0	+13,185.2

Source: Central Bureau of Statistics

The 1983 trade with the European socialist countries--because of a relatively high import surplus of the previous year--had to be planned in a way that permitted an 11 percent increase of Hungarian exports and a 7.4 percent increase of imports. The annual barter agreements--from the aspect of the total trade--were exceeded by 1.3 percent and thus trade with the European CEMA countries in 1983 has increased from the previous year by 10.5 percent. Within this, imports have increased to a larger extent, exports have increased to a lesser extent than was required by the agreements.

The main reason for this is that the trading partners were able to deliver over and beyond the contingent during the year but their purchases--especially in the case of Czechoslovakia, Romania and partly the GDR--have not reached the planned volume. In comparison to the previous years, there has been no significant change in the product structure of exports and imports. A significant part of the exports continue to be machine industry, agricultural and food industry products while imports continue to consist mainly of machine industry, chemical industry and light industry goods.

This year, in order to achieve a balance of payments, exports must be increased more than imports in the ruble-based trade. For this reason, a 7 to 8 percent increase of exports are planned for 1984 while imports will stay at least year's level. However, a larger increase of exports will make it possible to increase the imports as well. For unlike in the previous years, a new situation has come about in the ruble-based trade, namely, a further increase in trade depends mainly on the increase of Hungarian exports.

### Hungary's Foreign Trade in 1983 With Some Important Countries

Magyarország külkereskedelem fontosabb országokkal 1983-ban									
(21) Sorrend '83	(22) Ország '82	(23) Összesen millió forint	(24) Bevoztal			(28) Kivitel			(31) Egyenleg millió forint
			millió forint	%-ban	sorrend '83	millió forint	%-ban	sorrend '83	
1. 1. Szovjetunió	222 290,5	104 186,4	108,8	1.	1.	118 104,1	108,6	1.	+ 13 917,7
2. 2. NSZK	64 815,1	37 271,1	103,1	2.	1.	27 544,0	118,3	2.	- 9 727,1
3. 3. NDK	46 349,0	24 399,9	109,8	3.	3.	21 949,1	110,5	3.	- 2 450,8
4. 4. Csehszlovákia	36 746,9	18 711,0	109,5	4.	4.	18 035,9	100,1	4.	- 675,1
5. 5. Ausztria	33 477,6	17 162,0	106,3	5.	5.	16 315,6	133,2	5.	- 846,4
6. 6. Lengyelország	30 702,6	15 948,3	126,1	6.	6.	14 754,3	121,3	6.	- 1 194,0
7. 7. Jugoszlávia	26 091,9	13 284,3	133,0	7.	7.	12 807,1	118,8	7.	- 477,7
8. 8. Olaszország	20 899,5	8 471,2	96,4	12.	9.	12 426,3	112,3	8.	+ 3 957,1
9. 15. Libia	19 942,5	15 353,0	218,5	7.	11.	4 407,5	147,3	17.	- 11 127,5
10. 10. USA	17 192,9	9 584,3	137,4	10.	13.	7 608,6	149,1	10.	- 1 975,7
11. 9. Irán	16 543,1	9 109,2	103,2	11.	8.	7 433,9	90,3	11.	- 1 675,3
12. 13. Svájc	13 412,5	7 888,4	111,0	13.	12.	5 524,1	128,6	15.	- 2 364,3
13. 11. Franciaország	12 631,3	6 857,2	95,3	15.	10.	5 774,1	118,4	14.	- 1 083,1
14. 16. Bulgária	12 421,6	5 770,9	127,1	17.	17.	6 650,7	127,0	12.	+ 879,8
15. 19. Brazília	12 286,7	10 034,4	159,7	9.	16.	2 252,3	376,7	.	- 7 782,1
16. 17. Nagy-Britannia	11 963,8	7 792,2	118,6	14.	14.	4 171,6	143,5	18.	- 3 620,6
17. 12. Románia	11 501,0	6 673,5	105,1	16.	15.	4 827,5	94,7	16.	- 1 846,0
18. 14. Irak	8 496,5	844,5	695,7	*	*	7 652,0	76,5	9.	+ 6 807,5
19. 18. Hollandia	8 195,8	4 571,4	103,6	18.	18.	3 624,4	107,4	19.	- 947,0
20. * Algéria	6 292,3	372,5	174,8	*	*	5 919,8	168,1	13.	+ 5 547,3

Megjegyzés: \* nem szerepelt az első 20 között; (+) kiviteli többlet; (-) behozatali többlet; az adatok a mindenkorai hivatalos devizaárnyamon, hotáparitáson, az előkalkulált fuvar költségek figyelembe-vételével szerepelnek. Forrás: KSH

Key:	1. Soviet Union	17. Romania
2.	GFR	18. Iraq
3.	GDR	19. Holland
4.	Czechoslovakia	20. Algeria *
5.	Austria	21. Rank
6.	Poland	22. Country
7.	Yugoslavia	23. Total, million forints
8.	Italy	24. Imports
9.	Libya	25. Million forints
10.	USA	26. Percent of 1982
11.	Iran	27. Rank
12.	Switzerland	28. Million forints
13.	France	29. Percent of 1982
14.	Bulgaria	30. Exports
15.	Brazil	31. Rank
16.	Great Britain	32. Balance, million forints

Note: \*was not included in the first 20; (+) export surplus, (-) import surplus; the data are based on the existing official rate of exchange, on free border and on pre-calculated costs of delivery. Source: Central Bureau of Statistics.

The value of exports based on convertible currency was about 10 percent short of the 1983 plan; the value of imports was 6.4 percent short. (These figures show the foreign trade activity in terms of dollars. Because of changes in the exchange rate, the data calculated in forints are 16.8 percent higher.) The Hungarian economy's loss resulting from a lower exchange rate was about 180 million dollars last year. The price of many products exported by Hungary has fallen dramatically in 1983 on the world market. The most dramatic fall involved export products of the food industry, especially beef-cattle, poultry, chopped pork and beef and fresh produce.

According to the data of the Central Bureau of Statistics, the foreign trade balance in 1983 showed an export surplus of 817 million dollars on the basis of contract prices, i.e., the values corresponding to the given foreign market. Considering the actual delivery payments, the active balance was 658.9 million dollars.

After 2 years of decrease, trade with the developed capitalist countries increased in 1983 in Hungarian foreign trade based on convertible currency. Total Hungarian exports directed to these countries were 11 percent higher, imports from them were 9 percent lower than in the previous year, calculated in current prices in dollars. Exports were increased mainly in Austria, Switzerland and the United States.

The product structure of the exports has changed somewhat as compared to the previous year: the exports of food industrial products increased by 2 percent, the exports of materials and parts increased by almost 3 percent but the exports of machines decreased by more than 5 percent. Exports of industrial consumer goods approached that of the previous year; within that, the value of exported medicines increased by about 4 times. There has been a significant change in the imports, namely, 37 percent less fuels, 21 percent less machines and more than 10 percent less materials have been imported.

Trade with the developing countries constitutes 12 percent of the entire Hungarian exports and 11 percent of the imports in 1983. The worsening economic conditions of the developing countries had an adverse effect in 1983 on Hungarian exports as well. The selling of Hungarian products was made more difficult by the fact that most developing countries--including some of those which export oil--are facing difficulties in payments and are thus forced to re-evaluate their programs of economic development, resulting in decreased investments and, especially, limited imports. Because of their problems in liquidity and payments, these countries are striving for a more balanced foreign trade, and part of those which have been paying by cash up to now, have requested credit.

Among our more important trade partners, Algeria, Libya and India were the ones which increased their imports from Hungary the most last year; on the other hand, Iraq, Iran and Syria decreased their imports significantly. Hungarian exports are expected to grow little in 1984, their value in dollars is expected to approach or even reach the 1983 level which was the highest so far. According to preliminary calculations, the Iranian exports may be increased significantly; exports to Algeria, Libya and Nigeria may also grow

to some extent. It might prove profitable if Hungarian enterprises pay more attention to middle-size markets that are able to pay but are not adequately explored, especially to the Arab countries, including Saudi-Arabia. But these markets--just like any other market--require an increased competitiveness of Hungarian products, an increase in quality, better packaging, and a better adherence to deadlines.

### Product Structure of Hungarian Foreign Trade in 1983

A magyar külkereskedeleml áruszerkezete 1983-ban

	(24) Rubel (26) elszámolások	(25) Nem rubel millió forint	(28) összesen	Rubel (31) elszámolások	(29) Nem rubel millió forint	(30) összesen	(33)
				előző év = 100			
(1) KIVITEL							
(2) Energiahordozók, villamos energia	1 186,6	30 186,2	31 372,5	107,8	167,3	163,9	
(3) Anyagok, félkésztermékek, alkatrészek	38 433,1	88 870,3	107 303,4	118,9	123,0	121,5	
(4) Nyers- és alapanyagok	3 717,9	16 467,5	20 185,4	117,9	131,8	129,0	
(5) Félkésztermékek	18 303,0	47 923,8	66 226,8	129,2	121,9	121,4	
(6) Alkatrészek	16 412,2	4 479,0	20 891,2	117,8	107,8	115,3	
(7) Gépek, szállítóeszközök, egyéb beruházási javak	69 416,3	26 983,9	96 400,2	115,7	99,1	110,5	
(8) Fogyasztási iparcikkek	26 840,9	26 224,9	53 065,8	102,3	114,5	108,0	
(9) Élelmiszeripari anyagok, élő állatok, élelmiszerök	24 242,0	61 723,7	85 965,7	111,5	104,8	106,6	
(10) Mezőgazdasági termékek, élő állatok	6 226,5	22 770,0	28 996,5	86,1	98,5	95,3	
(11) Élelmiszeripari termékek	18 015,5	38 953,7	56 969,2	124,1	108,9	113,3	
(12) Összesen	160 118,9	213 989,0	374 107,9	113,2	116,9	115,3	
(13) BEHOZATAL							
(14) Energiahordozók, villamos energia	52 829,4	26 556,2	79 385,6	110,9	155,6	122,7	
(15) Anyagok, félkésztermékek, alkatrészek	61 769,5	105 064,4	166 833,9	113,3	109,8	111,1	
(16) Nyers- és alapanyagok	22 958,2	25 792,0	48 750,2	113,1	120,6	116,9	
(17) Félkésztermékek	22 795,8	60 495,4	83 291,2	111,9	107,7	108,8	
(18) Alkatrészek	16 015,5	18 777,0	34 792,5	115,9	103,5	108,9	
(19) Gépek, szállítóeszközök, egyéb beruházási javak	38 527,9	21 576,6	60 104,5	111,2	93,3	104,0	
(20) Fogyasztási iparcikkek	17 120,1	14 809,5	31 929,6	103,8	114,7	108,6	
(21) Élelmiszeripari anyagok, élő állatok, élelmiszerök	3 637,1	23 072,4	26 709,5	67,6	133,0	117,5	
(22) Mezőgazdasági termékek, élő állatok	398,8	5 159,7	5 558,5	77,3	102,0	99,7	
Élelmiszeripari termékek	3 238,3	17 912,7	21 151,0	66,5	145,7	123,3	
(23) Összesen	173 884,0	191 079,1	364 963,1	109,6	115,0	112,4	

Megjegyzés: az adatok a mindenkorai hivatalos devizaárholymon, határaparitáson, az előkalkulált fuvar-költségek figyelembevételével. Forrás: Központi Statisztikai Hivatal

#### Key:

1. EXPORTS
2. Fuels, Electricity
3. Materials, semi-finished products, parts
4. Raw and basic materials
5. Semi-finished products
6. Parts
7. Machines, vehicles, other investment equipment
8. Industrial consumer goods
9. Food industrial materials, livestock, foodstuff
10. Agricultural products, livestock
11. Food industrial products
12. Total
13. IMPORTS
14. Fuels, electricity

(Key continued on next page)

Key: (continued from previous page)

15. Materials, semi-finished products, parts
16. Raw and basic materials
17. Semi-finished products
18. Parts
19. Machines, vehicles, other investment equipment
20. Industrial consumer goods
21. Food industrial materials, livestock, foodstuff
22. Agricultural products, livestock Food industrial products
23. Total
24. Ruble
25. Non-ruble
26. Accounts
27. Million forints
28. Total
29. Ruble
30. Non-ruble
31. Accounts
32. Previous year = 100
33. Total

Note: the data are based on the existing official rate of exchange, on free border and on pre-calculated costs of delivery.

Source: Central Bureau of Statistics.

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CSO: 2500/234

## HUNGARY

### LONG-TERM PLANS FOR INDUSTRY, FOOD INDUSTRY OUTLINED

Budapest IPARGAZDASAG in Hungarian Jan 84 pp 1-8

[Article by Tamas Levai and Laszlo Beres, Ministry of Industry: "Industry, Agriculture and the Food Industry Through the Year 2000"]

[Text] Within the framework of long-range planning, developmental concepts have been drafted for the economy's individual branches. Their elaboration occurred concurrently. Therefore there has been no opportunity as yet for the confrontation and coordination of the concepts.

After the drafting of the sectors' summary concepts and the debate on them, the current phase of planning is coordinating the concepts with one another, and with the hypotheses concerning the development of the entire economy.

Our study reviews the results to date in coordinating the concepts of industry, agriculture and the food industry, and forestry, with the participation of their respective experts.

#### I. Scope and Content of Relations

##### Industrial Supply Base

Parallel with the rapid development of agriculture and the food industry, development of the domestic industrial supply base also accelerated during the past decade but was unable to keep pace with the demand in terms of either quality or assortment. Industry (hereinafter by industry we mean industry without the construction and food industries) in the 1970's supplied in varying degree also the needs of agriculture and the food industry.

For example, industry supplied the entire demand for N fertilizer, and a significant proportion of the demand for P fertilizer. At the same time, development of the production of plant protectants started late but, once started, production rose rapidly. Development of the production of machinery for agriculture and the food industry accelerated only in the second half of the 1970's and followed the rising demand, although with a lag; but some of this machinery is obsolete. The production of packing materials and containers also developed, but the demand rose at a faster rate than the addition of new capacity, and import is considerable even today.

Development of the industrial supply base has been favorable also from the viewpoint of CEMA cooperation. As a result of the specialization and agrochemical agreements, import from socialist countries rose sharply, and at the same time the possibilities of exporting farm machinery and chemicals broadened, to both the rubel-denominated and hard-currency destinations. In spite of the industrial supply base's development, however, hard-currency import for productive consumption in agriculture and the food industry remained considerable.

#### Principal Characteristics of the System of Relations

--With the mechanization and chemization of agriculture, the emergence of production systems and the development of the food industry, the demand for industrial products rose sharply in terms of quantity, assortment and quality. The value of industrial implements and materials in agriculture's productive consumption doubled in 10 years, and their share approximated 65 percent. Within the food industry's net material cost the share of industrial products is 42 percent.

Typical of the mutual relations between the two branches of the national economy is that in 1981 agriculture and the food industry used industrial products worth 87 billion forints (including import), while industry processed 21 billion forints' worth of farm products.

Nearly a fifth of industry's outside sales at present is to food production and its related export. The largest supplier of agriculture and the food industry is the chemical industry that includes also petroleum refining; its share of sales is close to 60 percent. The share of engineering is 15 percent, and the share of the sectors that make packing materials and containers is likewise 15 percent.

--In harmony with the national economy's development, the areas of cooperation covered practically every area within the two branches. In addition to simple commercial relations, new and modern forms of collaboration (production cooperations, associations, etc.) also evolved.

Within the farms' ancillary activity, industrial activity is becoming more and more significant. The farms already have an important role in developing engineering's supply base, and in chemical-industry and light-industry processing.

--Relations at present are expanding not only in production, but also in such areas as energy conservation, joint research and development, coordination of environmental-protection tasks, etc.

#### II. Requirements of Agriculture and Food Industry

Within the framework of long-range planning, as we have noted, the long-range concepts of industry, of agriculture and the food industry, and of forestry were prepared concurrently.

This concurrence warranted a comparison of the concepts, an investigation of their objectives, conditions and interactions, and the resolution of their possible contradictions. The comparison was made jointly by experts of the Ministry of Industry, and the Ministry of Agriculture and Food.

The comparison showed that there was no contradiction between the long-range objectives of industry and those of agriculture and the food industry. Industry is striving to supply from domestic production a larger share of the growing demand of agriculture and the food industry, with products of better quality and in a wider assortment. For it is one of industry's primary objectives to develop machinery, equipment, chemicals, etc. that are modern and meet the requirements of domestic users as well as of foreign markets (both socialist and nonsocialist). It is our basic intention to help agriculture and the food industry to improve their performance and to fulfill the general objectives of economic policy (for example, to reduce the consumption of materials and energy).

On the other hand, however, industry's requirements for agricultural raw materials also will increase in the future, in terms of both quantity and quality.

#### Demand for Machinery

Agriculture, the food industry, and forestry placed 100 billion forints' worth of machinery and equipment in operation under the preceding five-year plan. In terms of value, 42 percent of the procured machinery was domestic and 38 percent was from socialist import. The remaining 20 percent had to be imported for hard currency. In terms of assortment, domestic production supplied more than 60 percent of agriculture's demand for machinery.

#### Production of Machinery for Agriculture and Food Industry Must Be Developed

As a result of investments, the level of mechanization improved in the most important branches of farming. But the optimum composition of the stock of machinery, adapted to the yields, did not develop in every branch. The farms are still using also many machines that are obsolete and have a low performance.

With the food industry's reconstruction, the level of its mechanization likewise improved, but to different degrees by sectors. In general the stock of machinery can be termed of average quality.

The machinery demand of agriculture, the food industry, and forestry will increase further in the coming decades, as a result of the expansion of food production and the improvement of efficiency and productivity. According to preliminary estimate's, the demand for machinery in 1995-2000 will increase 1.5-fold over the procurement under the 5th Five-Year Plan. The sharpest rise in the demand will be in agriculture and forestry, including the lumber industry.

Aside from their quantitative demand, agriculture and the food industry are setting higher requirements also regarding the modernness and quality of the machinery. The supply of parts necessary for the operation of the machinery will likewise have to be solved better than at present.

All this requires the further vigorous development of machinery production for agriculture and the food industry. The ratio of machinery and equipment per worker rose rapidly in this branch of engineering during the second half of the 1970's, but in spite of this its level of mechanization is still only average. Its 1980 output exceeded 14 billion forints. Fifty percent of its products was used at home, and 50 percent was exported.

Within the production of farm machinery we are making heavy tractors and systems of implements, horticultural machinery, machinery for growing and processing fodder, machinery for livestock production, plant-protection machinery, farm machinery for materials handling, and small machines for use on household plots. For the food industry we are producing machinery primarily for the milling, baking and dairy industries, equipment for slaughterhouses, and machinery for the poultry and canning industries.

If the development projects planned for engineering are realized, it will be possible to supply from domestic production, in a wider assortment and with better quality, about 50 to 55 percent of the demand for machinery in agriculture and the food industry, as compared with 42 percent at present (see Figures 1 and 2).

According to the current view, no basic change can be expected in the product mix of machinery production for agriculture and the food industry. However, some broadening of the product mix can be expected, due primarily to the energy situation and the curtailment of import.

A more extensive change of the product mix and a higher share of domestic products than the targeted 50 to 55 percent would be expedient for economic reasons only if the broader product mix would permit an expansion of export that could ensure economies of scale. Further investigation of this problem is warranted.

The planned development of machinery production will permit wider socialist specialization and thereby also the supply of the growing demand for socialist import, while maintaining the level of the demand for machinery from nonruble-denominated import. Through the expansion of its export and by participating in the export of machinery systems, engineering is striving to earn the foreign exchange needed to pay for machinery imports.

#### Directions of Development

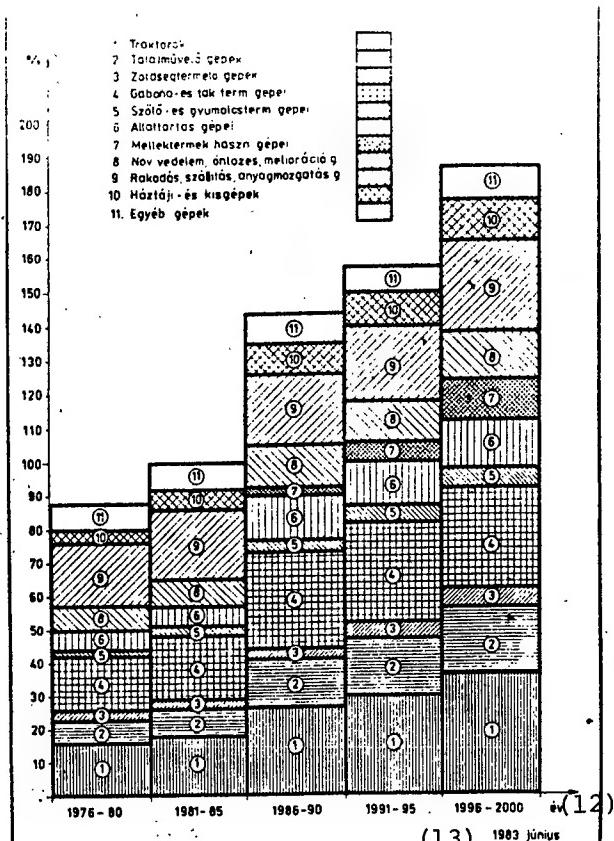
--In the production of machinery for agriculture and the food industry, development of the groups of products currently produced, and the broadening of the product mix with the addition of machinery for the processing of by-products and with the production of certain types of forestry machinery, must continue to be treated preferentially.

--Within the principal groups of products, priority must be given to developing the machinery and equipment necessary for the production of grain and corn.

--In the further development of machinery and equipment used in the livestock-production sections of the farms, a new requirement--over and above the conditions of economical operation--is the preferential development of equipment necessary for the utilization of by-products (manure, methane, etc.).

--The technical conditions must be ensured for the evolving energy-efficient processes in conjunction with the storage and preservation of grains.

--The necessary machinery and equipment must be developed in harmony with the advances in the technology of growing, harvesting and preserving forage crops.



**Figure 1. Foreseeable development of farm-machinery production's output and product mix that can come into consideration for domestic marketing (second variant).**

**Key:**

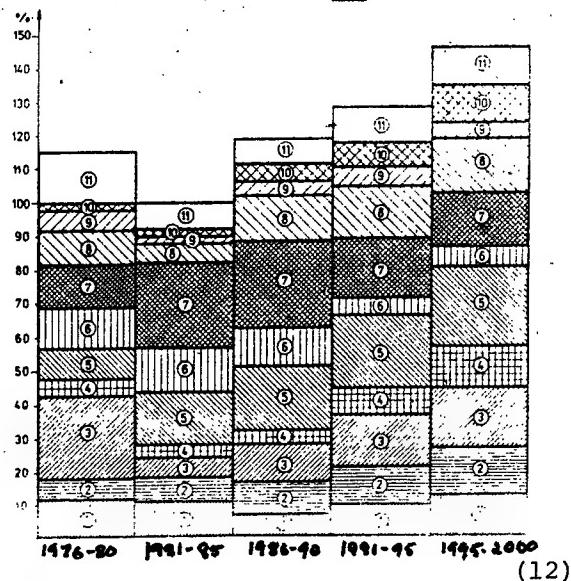
- |  |   |
|--|---|
| 1. Tractors                                  | 7. Machinery for utilization of by-products                         |
| 2. Tillage tools                             | 8. Machinery for plant protection, irrigation, and soil improvement |
| 3. Machinery for vegetable production        | 9. Machinery for loading, hauling and materials handling            |
| 4. Machinery for grain and fodder production | 10. Machinery for household plots and small machines                |
| 5. Machinery for vineyards and orchards      | 11. Other machinery   |
| 6. Machinery for livestock production        | 12. Year  |
|  | 13. June 1983   |

--The development of machinery systems for the loss-free and energy-efficient hauling and storage of the large volume of biomass is a key issue.

--In developing machinery for the food industry, a preferential requirement is the development of machines that will permit an improvement of quality, a higher degree of processing, and plant automation.

--A new task is to supply the machinery demand of small catering enterprises, and to broaden the assortment of small machines for household plots.

1. Gobonipari gépek  
 2. Sütiipari gépek  
 3. Húspari gépek  
 4. Bőrémítőipari gépek  
 5. Konzerv- és hűtőipari gépek  
 6. Cukor- és édesipari gépek  
 7. Bor-, sór- és szeszipari gépek  
 8. Tejipari gépek  
 9. Novényolajipari gépek  
 10. Melískitermékfeldolgozó gépek  
 11. Egyéb gépek



(12)

**Figure 2. Foreseeable development of food-industry machinery production's output and product mix intended for domestic marketing.**

**Key:**

- |   |  |
|---|--|
| 1. Grain-industry machinery                         | 7. Winery, brewery, and distillery machinery |
| 2. Baking-industry machinery                        | 8. Dairy-industry machinery                  |
| 3. Meat-packing machinery                           | 9. Machines for vegetable-oil industry       |
| 4. Poultry-industry machinery                       | 10. Machines for processing by-products      |
| 5. Machinery for canning and refrigeration industry | 11. Other machinery                          |
| 6. Machinery for sugar and confectionery industry   | 12. Year                                     |

--Efforts must be made to retrofit existing production lines with automation, and to develop new machinery and installations with automation and microprocessor control.

--Within each group of products, preference will have to be given in the future to the development of machinery and equipment that lend themselves to economical operation and maximally satisfy the technical and safety requirements.

#### Conditions for Development

With the attainment of these objectives, the technical level, reliability and performance of the domestically produced farm and food-industry machinery will improve and can better meet the ever-stricter requirements.

There are, of course, also certain conditions for the development of machinery production. By the year 2000, for example, it will be necessary to replace the present stock of machinery with modern, automatic machine tools. At the present prices, the investment cost of this replacement will be about 6.0 billion forints in the 1980's, and an investment of the same order of magnitude will be necessary also in the 1990's.

Other conditions include the training of suitable experts, reinforcement of the R & D sections, purchasing of foreign licenses, the establishment of cooperations, and the development of customer services.

Engineering and the appropriate domestic-trade organization must also expect emphasis to shift to using machinery longer because of the limited investment possibilities, and therefore the demand for spare parts will increase. In the area of services, the division of labor between industry and the farms will become broader.

#### Manufactured Fertilizer

The use of manufactured fertilizer has been a decisive factor in the attained level of farm production. The following time series characterized the relationship between farm output and manufactured fertilizer consumption in 1960-1980:

	<u>1960</u>	<u>1970</u>	<u>1980</u>
Index of crop production (1950 = 100)	121	135	193
Fertilizer consumption, active ingredient (kg/ha)	23	122	211
Total consumption, active ingredient (1000 tons)	168	837	1399

Until the late 1970's, the consumption of manufactured fertilizer rose rapidly in Hungary; artificial fertilizers played the leading role in improving soil fertility, while stable manure lost ground. The growth of fertilizer consumption was arrested in 1979-1980, while consumption continued to rise in the European countries where it had been higher than in Hungary.

Primarily a further dynamic growth of manufactured fertilizer consumption can provide the basis for the level of crop yields anticipated long term. Even if we assume increased use of stable manure, the computations show that by the year 2000 it will be expedient to target a more efficient consumption of 2.5 million tons of active ingredient, as compared with 1.4 million tons in 1980.

Domestic production of manufactured fertilizer rose sharply during the past two decades, parallel with the demand:

	<u>1960</u>	<u>1970</u>	<u>1980</u>
	(1000 t active ingredient)		
Single fertilizer (N and P)	102	518	688
Compound fertilizer (NPK)	-	-	355
Total production	102	518	1043
Domestic production in percent of consumption	60.9	61.9	74.5

With export and import more or less balanced, the demand for N fertilizer is being supplied at present from domestic production. Domestic production of P fertilizer is substantially lower than the demand, and a large proportion of the products is obsolete. In the case of K fertilizer, due to our natural conditions, we must rely entirely on import.

We have prepared numerous variants for supplying from domestic production the vigorously growing long-term demand.

According to the basic variant, for the supply of N fertilizer we may continue to rely on domestic production and on the fertilizer imported under the Hungarian-Soviet agrochemical agreement. Significant investments for capacity expansion are not necessary, but reconstruction of the capacities that produce the starting material (ammonia) will be necessary in any case. Reconstruction will be expedient also from the viewpoint of energy conservation.

Although the starting materials have to be imported, expansion of the domestic production of P fertilizer results in considerable import substitution, but development is capital intensive. The economic efficiency of production, secure supply, and the fact that about 70 percent of the production capacity is obsolete also warrant developing the domestic production of P fertilizer.

Simultaneously the reconstruction and development projects will also improve quality and raise the proportion of products in quality grade I.

#### Transportation, Storage and Mixing Are Key Issues

A key problem in the consumption of manufactured fertilizers is to solve their transportation, storage at the point of application, and mixing.

Within agriculture, therefore, agrochemical centers must be established successively. There are 29 such centers in operation in 1983. Further expansion of the centers is also a prerequisite for using liquid fertilizers. Agriculture's demand for liquid fertilizers will increase substantially by the year 2000: a 35-percent share for N fertilizer, a 20-percent share for P fertilizer in terms of active ingredient, and a 15-percent share for K fertilizer in terms of active ingredient have been forecast. The present consumption of liquid fertilizers is insignificant.

According to the basic variant, fertilizer production and its more efficient use will require over a period of 20 years an investment of about 32 billion forints in industry, and about 10 billion forints in agriculture (for the establishment of agrochemical centers).

Naturally, if variants calling for less investment are realized, it will be possible to supply less of the demand from domestic production, and the import volume of especially P fertilizer will increase.

#### Plant Protectants

The value of the plant protectants currently used in Hungarian agriculture is between 6 and 7 billion forints a year. In recent years, 58 to 64 percent of

the consumption has been supplied by Hungarian industry; 30 to 35 percent, from capitalist import; and 6 to 7 percent, from socialist import.

According to the forecasts, no basic change is expected in the consumption of plant protectants in terms of quantity, but there will probably be a moderate growth in terms of value since smaller amounts of more effective but also more expensive plant protectants will be used.

It should be borne in mind, however, that the product mix of the preparations used might change. This structural change could be basically influenced by the appearance of new plant protectants, the introduction of entirely new and effective plant-protection practices, and by plant-breeding results that produce new disease-resistant varieties.

In the coming decades the use or the demand for the production of growth regulators will foreseeably increase, in the interest of higher yields.

Within the technologies of plant protection, the role of seed dressing and soil fumigation will increase on intensively cultivated land, chemical weed control of horticultural crops will develop further, and the use of biologically active preparations in orchards will spread.

As a result of advances in plant-protection technologies, we can expect a further reduction of the amount of spraying solution per hectare, which will be accompanied by stricter requirements regarding the quality of the plant protectants.

#### Opportunities for Economical Export

We are exporting even now a substantial proportion of our output of plant protectants, and the developmental concept anticipates the maintenance and further expansion of this export. Under the agrochemical agreement concluded with the Soviet Union, this export has an important role also in supplying agriculture with manufactured fertilizer.

Supply of the domestic demand and socialist export permit economies of scale that also make economical hard-currency export possible.

If we take all this into consideration, and if the planned development projects are realized, then it will be possible to supply from domestic production 75 to 80 percent of agriculture's long-range demand for plant protectants, parallel with a significant export. Efforts must be made to develop specialization among the socialist countries and to increase the volume of import from them.

#### Chemical-Industry Feed Additives

The rise in the demand for these products will be exceptionally sharp. According to estimates, total consumption is expected to increase from about 70,000 tons in 1985 to 136,000 in 1990, and to approximate 180,000 tons by the year 2000. The feed additives supplied by the chemical industry may consist of many products, and their domestic production is not significant as yet. The expansion of production or the construction of new capacities will be expedient in

any event, and both branches of the national economy have such long-range objectives.

#### Preferential Products

Special mention must be made of three products because of their development, volume and significance: L-lysine, feed phosphate, and single-cell protein. In terms of quantity, these products account for more than 90 percent of the total demand.

We expect to produce all three products domestically. Farms are preparing economic feasibility studies of building an L-lysine plant with a capacity of about 6,000 tons. If the results of the studies are favorable, production could start under the 7th Five-Year Plan. The production of feed phosphate is closely linked to the development of the production of P fertilizer, and therefore the construction of a 60,000-ton plant can be planned for 1990 at the earliest. If economically efficient, the production of single-cell protein can be realized likewise in the 1990's. A feasibility study is being prepared of a plant with a capacity of 100,000 tons/year.

#### Veterinary Medical Preparations

The most important future task in veterinary hygiene is the reduction of livestock losses. Considering the value of Hungary's present livestock population (about 180 billion forints), a reduction of livestock losses by one percentage point would save 1.8 billion forints in livestock production. This can be achieved at a relatively modest outlay for veterinary medical preparations.

Livestock production's annual consumption of drugs and vaccines is 1.1 to 1.2 billion forints. Considering the forecasts of the livestock population's development and the trends in the use of drugs, we can expect approximately a 5-percent annual increase in the consumption of drugs and may thus project an annual consumption of about 2 billion forints by the year 2000.

In spite of the fact that since the 1960's, due to the development of large-scale farming, the demand for and the production of veterinary medical preparations rose sharply, in harmony with the sudden changes of the production conditions in agriculture, the Hungarian pharmaceutical industry is able to supply 60 to 70 percent of agriculture's demand and still maintain its significant export.

#### Plastics

Agriculture's demand for various plastic products is very substantial. Total consumption (not including containers) accounts for more than 10 percent of Hungary's plastics fabrication capacity.

Demand will increase further, and it is estimated that agriculture's direct consumption of plastics will increase from 33,500 tons in 1982 to 55,000 by the year 2000. Various films, hoses and pipes account for most of the consumption.

The Hungarian chemical industry manufactures the resins from which the plastics fabrication industry will be able to supply the demand for finished plastic products, if its fabrication capacity is expanded.

#### Packing Materials and Containers

The demand for packing materials and containers in agriculture and in the food industry in particular is substantial and accounts for about 60 percent of the total consumption nationwide. In 1980, agriculture and the food industry used about 11 billion forints' worth of packing materials and containers, and within this the food industry's consumption was 9.8 billion forints.

The demand for packing materials and containers will increase through the year 2000 at a faster rate than food production, for the following reasons:

- The proportion of products processed to a higher degree will increase within agriculture and the food industry;
- Export will expand at a faster rate than the growth rate of production, and export's share of the output will rise. It is common knowledge that export is more demanding with respect to packaging;
- Consumption will shift in the direction of more modern packing materials and containers, partially to broaden our export markets, and also to improve the quality of domestic packaging;
- Packaging for the convenience of consumers will expand also domestically (for example, the packaging of meat products).

#### Structural Changes

Demand will change also in terms of its structure. Growth will be the fastest in the use of combined packing materials, and there will be significant growth in aluminum products and certain plastics. The canning industry is reducing its demand for galvanized sheet and is increasing its demand for glass containers. The demand for paper-base packing materials and containers will likewise increase, but their share of total consumption will decline.

Packing materials and containers, except the ones made of wood and glass, are produced by enterprises under the Ministry of Industry. In recent years, the sectors that produce containers have made a considerable effort to supply the rapidly growing demand. They expanded their production and introduced new, more modern products. In spite of this, they have been unable to keep pace with the growing demand, neither in quantity nor in terms of quality and assortment. For this reason we are forced to import a significant volume.

In the future we must strive to supply the packing material and container demand of agriculture and the food industry also in terms of quality and assortment as well as quantity, and to reduce the share of import. However, our knowledge at present is still too sketchy to enable us to determine unambiguously how much investment will be necessary. Eventually, a more detailed breakdown of the demand will be necessary, and also the national demand will

have to be assessed over and above the demand of agriculture and the food industry, to allow the industrial enterprises to include in their development plans the expansion of their production capacities.

#### Auxiliary Materials Supplied by Chemical Industry

The food industry uses many kinds of auxiliary materials supplied by the chemical industry (for example, organic acids, preservatives, dyes, etc.). Surveys indicate that the present demand is about 20,000 to 25,000 tons, and a moderate rise in consumption can be expected in the future. Among the chemical auxiliary materials the most important ones in terms of volume at present are citric acid and acetic acid.

Domestic production of auxiliary materials has not been solved as yet, and a large share is being imported. Therefore we will have to investigate in the near future which items within this product group of relatively large volume could be produced economically at home. The domestic production of citric acid is already being investigated concretely.

#### Energy Management

Agriculture, the food industry, and forestry jointly account for about 10 percent of the total energy consumption within the national economy.

In the first half of the 1970's the energy demand rose at a rate faster than the average for the economy. In the late 1970's and in 1980-1981, however, the energy demand dropped by 2 percent a year, as a result of energy conservation measures.

There are additional real possibilities for slowing down the rate of energy consumption. Surveys indicate that each 1-percent increase in food production requires only 0.5 to 0.8 percent of additional energy. However, this demand for additional energy does not mean additional fossil fuel, because the consumption of external sources of energy will not increase, and is even expected to decline, by utilizing as a source of energy a part of the food-industry and forestry by-products and also by harnessing other, renewable sources of energy (for example, geothermal and solar energy). It is estimated that if 15 percent of the produced by-products can be used to produce energy (as fuel or to generate methane), this could replace about 800,000 tons of fuel oil that has a calorific value of about 32 petajoules. This is roughly 40 percent of agriculture's total energy consumption at present.

#### R & D Demand

Satisfaction of the requirements in agriculture and the food industry sets great demands not only for production but for research and development as well. Continuous modernization of farm and food-industry machinery and development of energy-efficient types are proceeding under the appropriate research programs of the Ministry of Agriculture and Food. An especially great research task is the research and development that provides the groundwork for expanding the production of plant protectants, and the development of original pesticides and procedures. This is an important part of the national research plan.

There is significant R & D activity in other areas as well. We should point out the already successful work on using agricultural wastes as sources of energy.

### III. Industry's Requirements

Farm, forestry and primary lumber-industry products are important raw materials of several industrial sectors, and even the food industry supplies certain raw materials for industry. Mostly light industry and the chemical industry are interested in raw materials from agriculture and forestry.

The long-range demands for raw materials vary. The demand for some products (for example, flax and hemp) will not increase. Growth will be moderate for other products (for example, hides, pulpwood, and mine props), and vigorous for one or two products (furniture panel, and tallow).

Agriculture, the food industry, and forestry have been and will be able to supply in varying degrees industry's needs in terms of quantity and assortment, depending on the domestic conditions.

Industry's entire demand for fiber hemp, and about 30 percent of its demand for fiber flax can be supplied from domestic sources. Natural conditions in Hungary are less suitable for growing fiber flax. The acreages of hemp and flax will not have to be increased in the future on the basis of industry's demand, and we expect to maintain the present level of production on 5,000 hectares of each crop.

The wool industry uses the entire 12,000 tons of grease wool produced, which represents 62 percent of the industry's total wool consumption. Although the development of sheep breeding will increase the wool output in the coming years, this 62-percent share can hardly be increased in practice if we take into consideration also the increase of the wool industry's output. However, an important task of agriculture will be to significantly improve the quality of the wool and increase the proportion of combing wool.

In the leather industry, 37 percent of the cattlehides, 90 percent of the pigsskins, and 20 percent of the fur pelts are from domestic procurement. Within the leather industry's product mix we can expect increases in the demand for garment and furniture leather, and leather used to make fancy leather goods, in addition to the shoe industry's decisive demand. Agriculture and the food industry generally take into consideration the leather industry's long-range demand, but the possibilities of increasing the procurement of hides, skins and fur pelts must be investigated further.

The pulp and paper, furniture and (for the production of furfural) chemical industries are using considerable quantities of industrial timber, lumber and various lumber products. The consumption of mine props is likewise significant.

Numerous measures were introduced in recent years to conserve lumber. As a result, the consumption of imported pine could be reduced in the furniture, pulp and paper, and mining industries. This trend is expected to continue also in

the coming years, and the industrial use of chips and shavings is also expected to gain more and more ground. Primarily for this reason, the demand for industrial timber and other lumber products is expected to increase only moderately in industry, with the exception of the furniture industry.

Forestry and the lumber industry will supply also the long-term demand for domestic timber varieties.

#### IV. How Can Interbranch Cooperation Be Developed?

Besides investigating the mutual demand for products, the analyses covered also all the areas that will be assigned an ever-greater role in the relations between the two branches in the future. From among them we will single out the following three activities.

##### Industrial Utilization of Agricultural By-Products

According to the findings of a 1980 survey, Hungary produces annually about 54 million tons of vegetable matter (primary biomass) in terms of dry weight, 46 percent of which consists of by-products. To this there are added approximately 7 million tons of so-called secondary biomass (mostly stable manure) from livestock production, and 1 million tons of waste from the food industry.

We must strive for close to optimal utilization of the produced by-products. It is indisputable that secondary raw-material resources can best be utilized in "productive" agriculture, food industry and forestry, as fertilizer, feed, to produce lumber-industry products, gain energy, etc., but in some areas also industrial processing could gain ground in the future. Among the by-products, in our present judgment, primarily chips and shavings, and straw can come into consideration for industrial processing, and poppy capsules are another such by-product. All this, however, does not exclude the possibility that the circle of wastes suitable for industrial use might broaden. Therefore it will be expedient to investigate the possibilities of economically producing various industrial products from agricultural wastes, by fermentation, for example.

Present utilization is limited, and in this area we must narrow a considerable gap even by international comparisons.

According to the surveys, the utilization of chips and shavings can be increased, at relatively small investment cost, from 20 million cubic meters a year in 1980, to between 160 and 180 million cubic meters by the year 2000. This can save industrial timber and firewood, and perhaps can also serve to increase export allocations.

The paper and pulp industry uses straw for pulping. The annual demand is between 50,000 and 55,000 tons; it will double after the planned reconstruction of the pulp plant. Industry's demand for chips and shavings, as well as for straw, can be met.

##### Farms' Industrial Activity

Farms are conducting extensive ancillary activities. They produce industrial products, including food-industry products, provide services, and engage in

domestic trade, construction and transportation. A large proportion of the farms' ancillary activity is closely linked to farming, but the farms earn substantial income from explicitly industrial activities and services. In 1981, the farms' sales from activities that fell within the individual industrial sectors exceeded 20 billion forints. The most significant within this was engineering activity, with sales totaling 12 billion forints.

The agricultural cooperatives and state farms are reliable partners of numerous industrial enterprises. The production and assembly of products, parts and subassemblies that are custom-made or produced in small series might not be economical for large plants but advantageous for small and medium-size plants organized within agricultural cooperatives, aside from the fact that such production fills a need. Plastics fabrication, tire recapping, the production of ready-made clothing or partial industrial processes likewise can be mutually advantageous ancillary activities.

The farms are filling a need and performing a social-policy task also when they supply the local demand (of their members and local residents as well) for services such as maintenance of motor vehicles, repair of household appliances, etc.

The relative weight and role of ancillary activity in agriculture will increase in the coming decades. This follows from the fact that in agriculture, and within it in farming, the productivity of direct labor will rise at a rapid rate, and all or part of the manpower replaced in this manner will find employment in ancillary activity.

Within ancillary activity, industrial activity also can be increased. But the prerequisite for this are the development of cooperation between industrial enterprises and farms, the expansion of operational relations and, last but not least, the creation of mutual interest.

#### Joint Research and Development

Relations between the two branches of the economy in the area of research and development are becoming more and more significant with the expansion of food-industry production. Industry must offer agriculture and the food industry many new products, in an ever-wider assortment. The development of products and comprehensive technologies for agriculture and the food industry cannot be imagined without the joint efforts of the enterprises and institutions in industry and in agriculture and the food industry.

Every new industrial product or assortment--be it a machine, chemical, pharmaceutical, packing material or container--must be tested, evaluated and assigned to regular production in practice. Such joint research and development will become increasingly necessary in the future.

In the coming plan periods it will likewise be necessary to implement intensively the joint tasks specified in the government's energy conservation program, and in the target program for environmental protection within the OTTKT [National Long-Range Plan of Scientific Research].

Increasing emphasis will be placed in the coming decades on complete and close to optimal utilization of biomass. Although the main products and by-products of biomass originate in agriculture, the food industry and forestry, some of their aspects affect industry as well.

Agriculture, forestry and the food industry will remain the principal areas of biomass utilization within the foreseeable future. The current view holds that industry can play only a minor role in this respect, because in many instances industrial utilization of the by-products is not economical. Certain shifts in the main areas of utilization can be expected, however. Depending on the development of prices and on the advances in science and technology (in biotechnology, for example), the mode and principal areas of biomass utilization might broaden and expand in the 1990's.

It is not inconceivable that some waste (or main product) of food production might become an important raw material for certain subsectors of the chemical industry.

The two branches of the national economy must prepare for this eventuality and, in the case of clearly demonstrable mutual advantages, provide for quick realization. A prerequisite for this is the completion of the research and development necessary for utilization. Industrial enterprises and institutions, too, must join in the research and development, in the areas to be specified later on.

#### V. Questions to Be Solved, Long-Range Developmental Tasks

Comparison of the long-range concepts revealed that if industry's long-range objectives are realized, then the needs of agriculture and the food industry can be satisfied in larger quantity, better quality and wider assortment than at present. Simultaneously it can also be established that in some partial areas further investigation and refinement will be necessary within the framework of long-range planning or in the course amending the medium-range plans.

##### Main Questions Requiring Further Investigation

1. If the mentioned 50 to 55 percent of the machinery demand in agriculture and the food industry is to be supplied from domestic production, the engineering sector that builds machinery and equipment for agriculture and the food industry must improve its ability to export. With the expansion of the export market, more product types can be produced economically. In their medium-range planning the enterprises that make machinery must regard as one of their key tasks the ensuring of conditions for the expansion of export.
2. The demand for manufactured fertilizer must be specified more accurately in the course of medium-range planning because the intervals between the upper and lower limits of the demand in the long-range forecasts differ significantly, particularly in the case of N and K fertilizers in terms of their active ingredients. Precisioning is necessary to plan the preparation of the investments, the development and reconstruction projects, and the import and export shipments.

Within the demand for manufactured fertilizer it will be necessary to reconcile also the demand for liquid fertilizer, taking into consideration the possibilities of building agrochemical centers.

3. The food industry is consuming a significant volume of auxiliary materials produced by the chemical industry. Among them, the demand for citric acid is 3,000 to 3,300 tons a year. A decision will have to be reached already under the 6th Five-Year Plan on where to establish domestic production under the 7th Five-Year Plan, and on what technology to use, if domestic production appears economical. The product group of organic chemicals, the annual demand for which is 18,000 to 20,000 tons, requires further investigation to determine which products within it could be produced economically at home. At present these products are being imported predominantly from nonruble-denominated provenances.

4. In conjunction with the production of packing materials and containers, the tasks in medium-range planning are as follows:

--A more detailed and more accurate breakdown of the demand for packing materials and containers in the food industry; and

--A survey of the national demand for packing materials and containers, and a comparison of the demand with the production capacities or developmental possibilities.

5. In the coming years it would be expedient to prepare a more detailed estimate of the total demand for energy in agriculture and the food industry, and to determine more accurately the external and own energy resources.

6. As we have already noted, in the leather and fur industry 37 percent of the raw cattlehides, 90 percent of the pigskins, and 20 percent of the fur pelts are procured domestically. Demand is expected to rise moderately.

We must jointly investigate what measures could make it possible to supply the industry's entire demand with domestic cattlehides, pigskins and fur pelts. It will be expedient to investigate also the procurement of the hides and skins of other animals that could be utilized (fur pelts, the skins of small animals, and rabbit skins).

7. Domestic furfural production is unprofitable for technological reasons and because of high timber prices. The conditions of economical production are now being studied.

If the study shows that economical production is feasible, in the next plan period it will be expedient to investigate the construction of a new plant that uses forestry wastes or industrial scrap lumber, and where the by-product can be utilized economically through further hydrolysis or some other way.

8. During the next decade, parallel with the development of biotechnology, attention will focus increasingly on the complete and close to optimal utilization of biomass. In the 1990's, depending on how prices develop and on the advances in research and development, biomass (its main and by-products) will

be used also for industrial processing. Later on it will be necessary to specify those areas of research and development where the industrial enterprises and institutions must join these efforts.

9. Industry must continue to support the industrial activity on farms. The tasks in this respect are as follows:

--On the one hand, the engineering, chemical and light-industry enterprises must broaden the already existing production cooperations, in the interest of greater efficiency;

--On the other hand, the farms must be given assistance to establish new sections that will improve the supply of industry and of the population and will contribute toward the solution of supplier-industry tasks (production of subassemblies, spare parts and consumer goods, tire recapping, etc.).

10. The following factors influence to a large extent the development of relations between the two branches of the national economy, and of the demand for industrial products:

--The development of prices and incentives in agriculture and forestry on the one hand, and in industry on the other; and

--Significant departures from the planned quantities or product mix in agriculture and the food industry, or in industry.

A more thorough investigation of these factors is warranted.

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CSO: 2500/261

HUNGARY

SOLUTION SOUGHT FOR FOUNDERING STEEL INDUSTRY

Budapest NEPSZABADSAG in Hungarian 28, 29 Feb 84

[Article by reporter Katalin Bossanyi: "Steel Industry Dilemmas"]

[28 Feb 84 p 6]

[Text] 1. Why Was State Intervention Late?

Due to the protracted recession, the world steel industry is still foundering: capacities in the advanced capitalist countries are being utilized to 50 percent at best, smaller plants are going bankrupt one after the other, and unemployment is high. Not even the first effects of the economic recovery overseas have caused any movement in the steel industry, as evident from the fact that also this year, contrary to expectations, the prices of rolled stock are continuing to decline and are almost reaching the lower limit of what the economy is able to tolerate. Which indicates that this is not merely a temporary cyclic slump caused by falling demand and limited investment. Much more is at stake: a tension far more difficult to resolve, a structural crisis.

Since 1980, all this has been affecting the Hungarian steel industry to an increasing extent. Seeing the accumulating difficulties, last October the government declared ferrous metallurgy an ailing branch and introduced comprehensive measures to maintain the ferrous metallurgical enterprises in operation, to offset the losses in production and export, to streamline prices, and to improve the earnings of the workers employed there.

Crying Wolf

One might justifiably ask why this drastic intervention occurred only when trouble already accumulated. A contributing factor in delaying a comprehensive decision was that the world market successively repudiated the optimistic forecasts made at the beginning of last year. And also that neither economic management nor regulation had up to now a refined armory of instruments and a model suitable for curing ailing industries. (An intervention fund has been established only as of the beginning of this year.) But intervention was made more difficult also because it was evident from the very beginning that the difficulties were being compounded by the internal contradictions of the branch as well, in addition to the decisive world-market effects. To illustrate: capacity utilization in our iron and steel industry since the beginning of 1980

has been 90 percent on average, which cannot be considered a severe decline by international comparisons, and yet it has caused serious conflicts at home. First of all because the large enterprises within the branch were already operating at low profitability, but now--amidst rising production costs--their losses have mounted by far more than the dropout in their production, and hence also in their income. Financially the operation of these large enterprises became impossible already last year. But the development of the manpower situation reflects ferrous metallurgy's serious difficulties even better than the rapidly mounting losses do. In 1980 the industry was still expecting long-term employment problems, and the retraining and redirecting of the workers began in the Borsod area, causing no small uproar. But today the industry is coping with the most severe manpower shortage in its history: attrition has accelerated during the past three years to such an extent that in some instances it is jeopardizing even the maintenance of the principal processes.

These opposite effects also have contributed to the sharp debate that developed in recent years between the central agencies and the management and trade-union forums over the causes of ferrous metallurgy's problems, the assessment of their severity, and the mode of resolving them. Thus it will be warranted to review the main phases of this debate, to interpret the nature and direction of state intervention, and to demonstrate the present possibilities and difficulties in the metallurgical enterprises' search for solutions.

By way of introduction we should mention that the concept of ferrous metallurgy's development has been modified repeatedly since the early 1970's. The concept long prevailed that ferrous metallurgy had to be developed, in a quantitative sense, at a rapid rate; therefore the long-range plans anticipated an [annual] steel output of 5.0 million tons in the 1990's. This expansion of production was based not only on an increase in the domestic users' demand, but also on the well-known conditions of supplying the basic material, and on export which at that time was conspicuously economical. For in the mid-1970's rolled stock was the second most profitable export item, after goose liver. But the development projects were warranted also because mostly the rolling mills had been modernized during the preceding decade, and in the meantime the steelmaking capacities became obsolete. Thus the technological balance of ferrous metallurgy was upset, causing operational difficulties and production, organizational and transportation losses. This is why in the last third of the 1970's, after some debate, projects for the development of converter steelmaking and totaling about 20 billion forints were begun simultaneously at the Danube Iron Works and the Lenin Metallurgical Works. These two huge investment projects were to increase the nation's steelmaking capacity, according to the estimates at that time, to between 4 and 4.2 million tons by 1982.

#### Extreme Standpoints

However, correction of the economy's course in 1978 compelled a re-examination also of ferrous metallurgy's development. It turned out that through 1990 the economy would need only 3.8 to 4 million tons of steel a year. But the National Planning Office and even the ministry in charge of ferrous metallurgy came to this conclusion with considerable delay, only in 1982. A contributing factor to the delay in modifying the concept, in addition to the domestic factors of uncertainty, was also a lack of the international conditions' clarification.

But by the time it became apparent that long term we would be able to obtain from the Soviet Union only enough iron ore for this much steel (or that, even to maintain this quantity, we would have to contribute--jointly with the other CEMA countries--to the costs of expanding the Krivoy Rog ore mine), the modern new steel plants were already completed.

It is now easier to understand why extreme standpoints, both for and against, were able to develop regarding Hungarian ferrous metallurgy's problems, prior to state intervention. In particular, some financial experts questioned the timeliness of the large-scale investments that were underway; the metallurgical enterprises, on the other hand, were urging ever-more development projects, which not only irritated the economic environment but also weakened their own negotiating position. Many experts questioned, and are questioning even today, whether it was permissible to let the ripple effects of the crisis extend into manufacturing, by raising the prices of metallurgical products, for example. Thus ferrous metallurgy was forced to absorb for years the additional domestic costs of coke, coal and energy that were divorced entirely from the world-market prices. However, economic management was of two minds also in its assessment of export. While the enterprises were being urged to reduce their losses, the maintenance and even possible expansion of export was considered desirable because of the substantial net foreign-exchange earnings. But while we received 313 dollars for a ton of rolled stock in 1980, last year we earned only 222 dollars, and this year the prices are below 210 dollars a ton. In spite of this, the large enterprises remained in the market last year--the export of rolled stock earned the national economy 223 million dollars in 1983--but in terms of forints this export was not profitable for ferrous metallurgy.

In addition to this "environmental damage," however, the metallurgical enterprises' behavior also hampered the emergence of a common standpoint and the adoption of the central agencies' decision. Initially neither the senior ministry officials nor the metallurgical enterprises themselves wanted to believe that the recession, after the frequent cries of wolf, could really overtake Hungarian ferrous metallurgy as well. They were late not so much in recognizing the situation, rather in responding to it and in quickly developing the methods for remaining in the market. Therefore they were rather hesitant when the difficulties intensified. This was evident, for example, in missed shipping schedules, longer lead times, and occasionally in the deterioration of product quality. This further worsened the prospects of exporting and infuriated the domestic engineering enterprises. This led to the widespread acceptance of the following view by central-agency officials and users: "What we are witnessing is not so much a crisis of metallurgy, rather one of incompetence."

The world market's shock effects, the tensions in economic management and regulation, and the occasionally not exactly friendly assessment of the domestic partners deeply shook, but did not floor, the enterprises within ferrous metallurgy. Naturally, the enterprises needed time to come to from this shock; and also a thorough self-examination, which they underwent in 1982. Since they themselves had contributed toward the intensification of the problems, the large enterprises in ferrous metallurgy recognized that they could expect meaningful help from the central agencies only if they uncovered their internal reserves and attempted to cut their losses through their own efforts.

## Uncovering of Internal Losses

Therefore the large enterprises within ferrous metallurgy elaborated a comprehensive action program to use materials and energy more efficiently, and to reuse scrap. At the Danube Iron Works and the Lenin Metallurgical Works alone, it was possible to reduce production costs by 700 to 800 million forints in this manner. The enterprises streamlined also their internal organization and management, and they utilized in exemplary manner the possibilities inherent in the internal forms of entrepreneurship to provide more incentives and improve productivity. Product innovation accelerated; product quality improved substantially, except in the case of castings; and customers received better service. Naturally, all this required--in addition to the joint efforts of management and the working collectives--completion of the Dunaujvaros converter-steel plant on schedule and within the budget, successful trial operation of the integrated steel plant in Diosgyor, and the reconstruction projects in Csepel that technically can likewise be termed successful. Even though it became more difficult to work the foreign markets, more efficient production of better quality made marketing more flexible and enabled it to show more initiative. The level of export to capitalist countries was not only maintained but even expanded slightly, and a wider exchange of the assortment with the socialist countries improved domestic supply. All this could reduce ferrous metallurgy's losses foreseeably by a total of 4.0 billion forints by 1985.

Upon seeing the favorable effects of the internal measures and the first signs that ferrous metallurgy was coming to, and having established that world-market conditions were becoming more difficult and therefore any further delay in state intervention would now worsen domestically the situation of the large enterprises, the State Planning Commission decided last October to curb domestically the crisis in ferrous metallurgy.

[29 Feb 84 p 6]

### [Text] 2. The Price of Structural Change

State intervention did not wipe ferrous metallurgy's slate clean. The government strived first of all to curb financially the further proliferation of the unfavorable processes, and to win time for the troubled industry so that it could catch its breath.

As the first step, therefore, the government settled until 1985 the situation of the unprofitable Danube Iron Works and Lenin Metallurgical Works, and suspended and rescheduled the repayment of credits by the Ozd Metallurgical Works, the Csepel Iron and Steel Foundry, and the Csepel Iron Works. Thus ferrous metallurgy as a whole--with an output of 3.7 million tons of steel and 2.8 million tons of rolled stock, while maintaining the level of export to capitalist countries--will not be showing a loss this year. Admittedly, as they say, a profit of 2 percent is too much to die, but not enough to live on.

### Enterprises Not Cooperating

In addition, the central agencies have advised the enterprises to seek more efficient possibilities for internal cooperation than currently. For at present

the capacity loading of the three decisive large enterprises differs, while overall capacity is not fully utilized. For example, there is a shortage of pig iron in Dunaujvaros and a surplus in Ozd. The enterprises in the Borsod area are able to produce more steel and semifinished products than rolled stock, while at the Danube Iron Works the capacity of the rolling mills is the greater. These imbalances could be alleviated through mutual deliveries and cooperation. We have used the conjunctive mode because at present there are no incentives for the enterprises to cooperate; if they nevertheless cooperate, they do so at a loss. The reason is that the disproportionate pig-iron prices and the distortions of the production costs do not provide sufficient incentive for internal cooperation.

Some qualifications will be in order for the interpretation of this statement. In West Germany, for example, the government is subsidizing prices to support ferrous metallurgy. Therefore the domestic price level is higher than the prices attainable in export. In addition, joint action by the metallurgical enterprises is encouraged also through central measures, which is a sensible response in the present difficult production, marketing and employment situation. Perhaps the conclusion will not sound exaggerated that also at home, in the case of recession in the world market, better cooperation between enterprises that serves the current and long-range interests of the national economy should not be left to chance, assumed good intentions, or to only partially existing market forces.

With the introduction of so-called continental prices among the central measures adopted last year, it was decided to streamline also the price system of domestic ferrous metallurgy. This price system tracks the price changes in the world market; or more accurately, the price changes with the EEC that is our main export market. As a result, the price of coke has been reduced by 15 percent since October 1983; and the price of metallurgical coal, by 6 percent. On the other hand, the prices of sheet steel have increased by 6 percent, and also the prices of semifinished products and casting have increased slightly. In conjunction with these price movements we should take into consideration that, under the new rules of the game, the metallurgical enterprises could have increased by much more than this the domestic prices of rolled sheet and strip, which are still salable in the world market despite the recession and are in demand also at home. To protect manufacturing, however, the metallurgical enterprises were not permitted to do so on this occasion. Which makes questionable the justification of the criticism that higher prices in domestic ferrous metallurgy than in the world market contributed to the declining competitiveness of Hungarian engineering in recent years.

All this, of course, does not repudiate the generally held view that ferrous metallurgy's shortcomings in terms of product quality and assortment--in other words, its structural shortcomings--are hampering the present and future expansion of export in manufacturing, and within it mainly in engineering. After last year's financial settlement, therefore, the government instructed the Ministry of Industry to again review by the middle of this year the concept of ferrous metallurgy's development, while maintaining the principal directions already approved earlier, and to begin a radical transformation of its product structure.

On this occasion the concept's modification will not affect quantity. It will still hold true that the existing steelmaking capacity will cover Hungary's needs until the beginning of the 1990's. In the coming years, therefore, ferrous metallurgy will have to strive primarily to adjust more flexibly than heretofore to the domestic users' demand, and to increase the proportion of its products processed to a higher degree of fabrication. However, this structural innovation is fraught with many stresses.

#### Two Neighboring Castles

For ferrous metallurgy and engineering--instead of recognizing their interdependence and coordinating their developmental efforts--are facing each other like the two neighboring castles in storybooks. Engineering argues along the following lines: In spite of the substantial development projects in recent years, the country does not have enough of modern materials, forged semifinished products, and castings. And whatever is available is unrealistically expensive. And this not only ruins our present chances of exporting, but limits our competitiveness also long term. If, for example, the automotive industry, the farm machinery industry or machine building for the food industry--not to mention electronics or the instrument industry--were able to develop lots of new products within a relatively short time, ferrous metallurgy's lag would not enable them to produce these products even if they were in demand. Thus the verdict is that mainly ferrous metallurgy is perpetuating the state of engineering.

And the answer of the producers of basic materials? Let us examine more closely who is perpetuating whom! Five years ago the charge was that product innovation in manufacturing was being limited by a shortage of alloyed steels. The integrated steel plant in Diosgyor has been completed since then, but engineering is using just as little alloyed steel as 5 years ago. The large metallurgical enterprises claim that they would be able to produce already now more basic materials of better quality and in a wider assortment; however, engineering wants such materials only in principle; in practice its orders continue to be rather conservative. Naturally, technological and design considerations also play a role in this, but more decisive seems to be a lack of incentive, on both sides. Simply stated: engineering, for a variety of reasons, is unable and unwilling to pay the higher prices of more modern metallurgical products.

It is difficult to render justice in this dispute, and we cannot undertake to decide it. But one thing is certain: instead of pointing a finger at each other, it would be more expedient to seek mutually advantageous solutions. The more so because this superficial bickering could easily divert attention from the dilemmas of whether to develop or cut back, which profoundly determine structural change. For comprehensive structural modernization of industries and sectors has a price, both at home and abroad. The big question is only who has to pay for or advance this change.

And here let us digress slightly, because otherwise we will not get an answer to the question as to what is causing the present substantial losses in ferrous metallurgy, losses which cannot be explained solely by the decline of domestic production and by the world-market prices. Hindsight, of course, is wonderful.

But on the basis of technological and economic considerations it is easy to see that the two large metallurgical investment projects that make the production of alloyed steels possible, the ones in Dunaujvaros and Diosgyor, should have been undertaken at least a decade earlier, when the industry was flourishing. The harmful effects of delaying the decisions can be measured not only in the profit lost at that time, but also in terms of the present capital costs at double interest rates, which are simply crushing the enterprises to death. The point is not merely that the development costs are not being recovered in the prices under the present market conditions and regulators, but that these credits cannot be repaid within the foreseeable future. (Incidentally, for this very reason such capital-intensive development projects are now being financed in foreign countries--and not only in the developing countries--with grants and the state's financial participation, rather than with credits.)

Moreover, it should also be clearly understood that originally, of the two investment projects, only the development of the Danube Iron Works would have provided more steel, and hence more profit, for the country. (The investment project at the Lenin Metallurgical Works was intended to replace the obsolete and already hazardous Siemens-Martin steel plant.) But to make things even more complicated, we are unable at present to fully utilize the capacities of the converter and combined steel plants, while the obsolete open-hearth furnaces are still in operation, although at reduced capacity. Here again the reasons can be traced to shortcomings of the price system. The scrap necessary for the open-hearth furnaces is much cheaper than the production cost of pig iron. In the converters, however, scrap can be used only to a limited extent. Thus if the two large enterprises were to listen to technological reason and close down their open-hearth furnaces, the high pig-iron prices would increase further ferrous metallurgy's losses.

#### In a Stalemate, Develop

This is what you call a real stalemate! Ferrous metallurgy claims that we can extricate ourselves from this stalemate only with additional development projects. For example, new technologies should be introduced at the two converters, which would permit an increase of the proportion of scrap also in these installations. And in the vicinity of Zahony an ore concentration plant should be built in order to produce pig iron, and in the final outcome steel, from Soviet iron ore more economically than at present. Furthermore, it would unquestionably be warranted to modernize the foundry and forge at the Lenin Metallurgical Works, because modern engineering cannot be imagined without them.

And all this requires money and more money, measured in billions. (The costs of the additional investments required are estimated between 15 and 18 billion forints, at today's prices.) But to request additional development projects in an ailing industry is not one of the popular solutions and cannot be defended on economic grounds, even though the projects may be warranted technologically. And not merely because the large metallurgical enterprises have been operating at a loss in recent years, but because the country's economic equilibrium has limited the possibilities of further development, and the economy's investment structure has become one-sided for reasons of necessity. (In manufacturing, for example, for a good many years there has been no preferential development project that would have helped us also centrally to catch up with the world market. The only exception has been microelectronics.)

To this one might reply that if money is lacking for further development, then it is necessary to formulate a strategy for ferrous metallurgy's plan-conforming retreat. But if the industry were to "pull down its shutter" and from now on the necessary materials and semifinished products were obtainable only from import, this would cost the economy a billion dollars a year. Thus this again would not be a feasible solution. What would we have to do then, and what compromise would we have to make? It is the task of the competent government organs to examine and decide this question. By pointing out the present tensions and conflicts of interest, we merely wished to indicate the development or product-innovation dilemmas with which our ferrous metallurgy has been struggling for years, and which the present crisis has not triggered but has merely raised to the surface.

1014  
CSO: 2500/254

POLAND

GOVERNMENT URGED TO TAKE CHARGE OF R&D REMOBILIZATION DRIVE

Warsaw PRZEGLAD TECHNICZNY in Polish No 7, 12 Feb 84 p 10

[Text] On 15 December 1983 there was a meeting between Premier General Wojciech Jaruzelski and members of the scientific and technical community, in which several interesting proposals and opinions were introduced. Herein we print a text prepared by Professor Ignacy Malecki, a member of the Polish Academy of Sciences and the Association of Polish Electrical Engineers.

Scientific research, which is required for all technical progress, has found itself among those fields most adversely affected by the crisis. It is enough to remember that during the last 4 years, R&D's share of national income has fallen by about 40 percent. In order to resolve this problem, there have been many petitions directed to the Sejm and the government. We hope that these petitions will have some effect. But it is necessary to realize that outlays for research will not increase to such a degree as to cover required needs in the present research structure. In order to achieve the required effects, we must adapt the structure to available possibilities. This concerns not only the organizational structure but also the themes pursued in the research environment. Needed are three directions of action: concentration of research, making it more effective and ascertaining the consequences of its implementation.

In consideration of the developments in culture and higher education, as well as to provide a basis for the future, it is essential especially at the universities to conduct research over a broad spectrum. However, this is a field covered with a "thin level" of resources. For the national economy, it is essential not to concentrate too many of these resources on "Polish specialties." There must be a real concentration--not just a "frontispiece" to cover many different subjects. This concerns programs of sufficient weight for the entire economy. This does not mean fulfilling the majority of government orders but rather completing immediate technical requirements. Raising efficiency would depend on sharpening the selection process in all areas of research, the gradual elimination of research designed only to obtain an academic degree, the exclusion of technical activity in research and also the guarantee of a suitable base of concentration.

During the 1970's, Poland did not have a consistent research policy; now during the crisis a policy is needed more than ever before. This must be a

long-range policy that unmistakably specifies priorities and Polish specialties. Annual and 5-year plans must be based on prospects.

There is not enough time to name those specialties within the areas of science and technology. I shall limit myself only to the criteria for selecting them:

--specialties resulting from the basic products of our export. This means that progress in mining and shipbuilding will remain Polish specialties, because even a small amount of progress can save billions of zlotys;

--specialties whose development is indispensable for achieving a world-class level of high-technology products, especially oriented toward export. The important contribution of science in these specialties is necessary. Selection of these products is very important and complicated and bound up with conditions existing in world markets and with the division of labor in CEMA;

--specialties resulting from the need to perfect production processes. These are specialties for use inside the country to improve even the weakest links in production, material and energy problems, organizations and automation. In other words, we are talking about producing goods in a safe and economical manner that can meet the qualitative and quantitative needs of customers. Everyone involved has concrete tasks to perform for the industry.

The program to implement Polish specialties will require central direction through the complete utilization of mechanisms stimulating economic reform. This is why the conviction arose within scientific and technical circles for a plan to create a central organ called the Committee for Scientific-Technical Progress. This committee should have special authorization to implement research programs in science and technology. We cannot repeat the mistakes of the former Committee on Science and Technology and try to attach to one anchor the technology of automobile tires with the theory of gravitational waves. Because of its specifics, basic research requires various approaches. In addition to administrative guidance, the views of scientists, the Scientific Committee of the Polish Academy of Sciences and the Council of Basic Research are fundamental.

However, the institutional forms are not the most important factor here. The establishment of a clear conception of directions and the form of development for scientific research in Poland, which should put this deepening mass into order, is essential. This conception should contain the following: Polish specialties, a definition of the size and type of financial resources for research, mechanisms for stimulating scientific-technical progress, the status of employees in scientific positions and the structure of lead organs coordinating research.

The complete realization of this program will require a longer time, but some of these proposals need to be decided upon quickly.

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CSO: 2600/693

POLAND

ACADEMY OF SCIENCES CONFERS ON INDIGENOUS RAW MATERIALS MANAGEMENT

Conclusions of Ney Report

Warsaw NAUKA POLSKA in Polish No 3-4, May-Aug 83 pp 13-61

[Paper presented by Roman Ney, a corresponding member of the Polish Academy of Sciences, at a meeting of the Polish Academy of Sciences General Assembly held on 28 Jan 1983: "Exploitation of Indigenous Raw Materials Resources"]

[Excerpt]

General Recommendations

A number of individual recommendations follow from the needs discussed in this paper; these have been specified in the preceding sections.

Implementing these suggestions will only be possible if a major part in this endeavor is assigned to science. It must develop with adequate leading time the scientific principles for solution of the particular problems, often considering several alternatives.

In conclusion, I would like to emphasize some of the general recommendations concerning all raw materials. I do not speak of organizational aspects, because they must be clear from the substance of the particular recommendations.

1. Poland has a diverse spectrum of various mineral resources which, generally, on an international scale, can be evaluated as substantial. However, besides resources with large or very large reserves, there are materials with small and very small reserves. Some raw materials are lacking, and there are no prospects for discovering more of them. This situation calls for the more efficient utilization of all of mineral resources available.

2. It is necessary to develop methods of efficacious government economic policy regarding the exploitation of raw material resources of Poland, co-ordinating these activities with the nation's socioeconomic development.

3. In order to secure an increase of mineral reserves, intense geological reconnaissance work should be continued both in areas of known deposits and in new regions. This should be based on analysis of geological structures of individual regions of Poland.
4. Exploration and documentation of deposits should precede the planning of mining operations in order to ensure optimum choice of deposits to be developed.
5. The mineral prospecting and reserve documentation methods should be modified, in particular by increasing the use of geophysical techniques. Documenting reserves should be a comprehensive effort covering, in addition to the main mineral, the accessory and waste minerals as well, so as to give development planners comprehensive geologic-engineering data.
6. The binding criteria of cost effectiveness should be enforced and verified to ensure efficient and economic exploitation of mineral raw materials and update the existing regulations in establishing the proven reserves.
7. Programs for broadening the utilization of domestic raw materials should be developed with special concern for ores and replacement of imported materials with domestic alternatives.
8. The balance of reserves of mineral resources should largely include the smaller deposits which must be developed by local industries to offset the deficits in material supplies. The balance must also reflect the general management of mineral resources.
9. Developing spatial management plans for individual operative and projected mines and areas in which deposits have been discovered is necessary. This follows from the need for a comprehensive analysis of production investments in a coordinated planning with the entire social and technical infrastructure.
10. Essential for efficient exploitation of deposits and environmental protection is comprehensive planning of resource management and of the development of entire mining areas, as well as individual mines. The projects should largely take into consideration the geologic specifics of a deposit, as well as the engineering aspects. They must consider in a general framework the operation and utilization of primary minerals as well as accessory and waste minerals. Measures for management and control of mining waters and pretreatment waters should also be planned for.
11. Projects outlining the management of open-pit mines should be mandated to consider the recultivation of territories after completion of the mining operation and define their future uses.
12. Systems of exploitation of mineral reserves and selection of machinery and equipment should be largely based on geologic features of deposits rather than the engineering parameters alone. This will ensure improved management of deposits by reduction of operating losses.

13. An important aspect is regular reduction of raw material losses at various stages in their exploration and processing. Specific plans should be developed for the individual materials to lower the losses, and implementation of these plans should be viewed as an element in the general appraisal of cost effectiveness of mining and processing industries.
14. It is impossible to attain any tangible improvement in the utilization of mineral resources without reducing the materials-intensiveness and energy-intensiveness of products. This is also crucial for the cost effectiveness of our economy and the further national economic progress.
15. More emphasis than has been placed until now should be put on thorough processing of minerals, even up to marketable end-products, with special concern for quality and state of the art. Polish industries based on indigenous raw materials should be defined.
16. Methods of recovery of valuable elements found in copper, tin and zinc ores and coal and other raw materials should be developed and introduced into practice. Some of these elements will not only meet the domestic demand but could become an export commodity, mainly in the form of end-products.
17. Special attention should be attached to the use of brown and bituminous coals as primary raw materials for the chemical industry. This includes, among other things, the modernization and development of coking and work on coal gasification and other processing technologies.
18. A better coordination should be ensured between Poland's participation in international economic cooperation with CEMA member nations, especially the Soviet Union, in the area of mineral resources.
19. In the international trade, we must strive to increase the export of products and goods resulting from processing of mineral raw materials, while importing primary unprocessed materials. This activity should be based on competent understanding of the world commodity markets and recognition of the material potentials, especially of Third World nations.
20. Principles of economic reform should be elaborated with special reference to the complex of mineral resources.
21. The Polish Academy of Sciences should provide greater incentives for scientific research involved in efficient utilization of the mineral resources. This objective should be served by a special publishing house to be created within the framework of the PAN.

## Conference Proceedings Summary

Warsaw NAUKA POLSKA in Polish No 3-4, May-Aug 83 pp 201-209

[Review of a conference of the Polish Academy of Sciences by K.H.-K.: "Problems of the Utilization of Domestic Mineral Resources (Warsaw, 28 Jan 1983)"]

[Text] In opening the second day of the session of the PAN General Assembly on 28 Jan 1983, Leonard Sosnowski, the Vice President of the Academy and its regular member, noted that the important issue of utilization of domestic mineral resources, which has a scientific and economic significance, has been in the Academy's focus of attention on many occasions. In particular, the Academy's General Assembly on 16 Dec 1977, after hearing the paper by Stanislaw Pawlowski, a regular member of the PAN, "Poland's Mineral Resources," noted that the continuing decrease of domestic mineral resources calls for efficient management of these resources and development of technologies of processing and beneficiation, ensuring their comprehensive use. For solution of these and other problems and closer ties between the earth sciences and the needs of the national economy, the PAN General Assembly at its session on 26 May 1978 approved the resolution on creation of its section VII--Earth Sciences and Mining Sciences. The current session again addressed the problem of raw materials by presenting extensive reports prepared by the Committee on Mineral Resource Management.

After the opening address by PAN Vice President Sosnowski and the paper by the chairman of the committee, PAN corresponding member Roman Ney, "Exploitation of Indigenous Raw Materials Resources," followed by an additional communication of the representative of the agencies concerned with agricultural and forestry sciences, regular member of the PAN Janusz Haman, a lively discussion was conducted. Participants in this discussion included: PAN regular member Andrzej Bolewski, PAN regular member Jerzy Litwiniszyn, Chairman of the Central Geology Administration Dr. Zdzislaw Dembowski, PAN regular member Stanislaw Leszczycki, General Director at the Ministry of Metallurgy and Engineering Industries Dr Boguslaw Sewerynski, PAN corresponding member Stanislaw Mrowec, department director at the Ministry of Mining and Energetics Dr Jozef Stemulak, PAN corresponding member Witold Gutkowski, PAN regular member Stefan Bialobok, PAN corresponding member Jerzy Znosko, PAN corresponding member Mieczyslaw Lubinski, PAN corresponding member Bogdan Baranowski, Professor Dr Stefan Kozlowski, PAN corresponding member Tadeusz Nowacki and PAN corresponding member Maksym Nikonorow.

Elaborating on and commenting about the critical, analytical and evaluative report distributed to the participants of the General Assembly, the speakers in the discussion emphasized that the Committee on Mineral Resource Management has prepared a foundation for implementing a program of subsequent activities. This must be a down-to-earth program that will answer not only the question as to what is to be done but also, and primarily, how it is to be done. The issue is particularly difficult, especially considering that in Poland today, as noted by Professor A. Bolewski, there are more than a dozen economic ministries, with a host of associations and concerns where, in the absence of a cooperative platform, "all are fending for themselves," and there is not even a common coordinated system of notions and definitions. In such a situation, assistance by the Academy to its committees is indispens-

able, so as to create such platform for contacts and cooperation between science and economic practice and set up a publishing house that would enable timely publication of materials covering the current trends in world science and economics.

The issue of creating a coordination organ for the economic plan was raised by the chairman of the Central Geology Administration, Dr. Z. Dembowski, calling for creation of a government agency capable of resolving the problems involved in the utilization of mineral resources, environmental protection and optimization of the raw material usages in the framework of coordinated government policy. Until now, the geologic service has documented over 3700 deposits of more than 50 different types of minerals. Of this number, developed deposits account for 50 percent, the others being the developmental reserves for future mining investment. According to studies and current state of knowledge about the geological structure of Poland, continued extensive development of mining of most basic minerals is approaching the critical point. Despite the development of geologic exploration and major financial outlays, its efficacy, measured by the number of pay deposits, displays a tendency to decline. This is a natural result of the principle according to which one begins by developing easily accessible deposits that yield themselves to less costly and technically less difficult exploitation. Currently, one has to search for new deposits at increasingly greater depths with smaller capacities occurring in more difficult geological and mining conditions; this calls for increasing investment to ensure increased output.

Optimizing the management of mineral deposits is a complex process that begins with the phase of exploration and documentation of reserves and runs all through the stages of deposit development, extraction and processing methods, until the final stage of utilization of mineral materials for manufacturing the end-product, using a technology which ensures savings of energy and materials. In the last few years, major achievements have been made in ensuring efficient management of reserves; in particular, a system of regulations has been developed and introduced into practice concerning the documentation of deposits, establishing the pay reserves, developing recommendations concerning construction projects to avoid building structures over mineral deposits, etc. If the status of legal regulations in ore, coal and rock mining is satisfactory, unfortunately, this is not true of the mining of chemical materials. The mechanisms of the economic reform involve certain changes in mining enterprises. With the thrust towards maximum profit, these operations do not always favor economical management of deposits, especially in parts occurring in difficult geological conditions with less attractive mining parameters. This calls for more stringent enforcement by control agencies responsible for surveillance of mining operations. This is an important function for the future government agency. The national wealth that we have should be managed with great thrift so as to save it as a base for future generations. The speaker recommended implementing the principle of comprehensive documentation of deposits, with a view to the fullest possible utilization of all minerals extracted from a deposit, improvement of mining, conducting possibly waste-free operation,

placing emphasis on technology of processing of domestic manual resources to a degree that would increase their range of applications, limit the export of raw materials, while promoting the export of more deeply processed products with a high quality standard and a narrow specialization in this sphere.

Looking at the economy of raw materials in terms of ecological consequences, PAN regular member Stanislaw Leszczycki stressed that the extraction of mineral resources and their processing, and thus the development of the mining and processing industries, involve continuing destruction of the natural environment and are leading us to an ecologic disaster. The issue entitled "We Do Not Want to Live in Conditions of an Ecologic Catastrophe" is to be discussed by the Academy at one of the sessions of its General Assembly. At the same time, it is impossible to stop planning new investments in extraction and processing. Nature itself determines localization of objects in mining, because mineral deposits and mining can and should constitute the underlying network for the entire infrastructure of the economy and society. If a proper principle of spatial planning is implemented--requiring that each square kilometer of the nation's territory be utilized in a socially beneficial manner--we will have adequate calculations when making decisions on exploitation of deposits and analysis of the results of exploitation, including the results of exploitation of mineral resources that constitute the focus of various investment and social and economic efforts, and areas of possible tension and conflicts, all given special importance in this framework. Building new mining enterprises and developing new mining districts must be studied in terms of losses to the environment and the total balance of public benefits rather than solely in terms of investment cost and simple cost effectiveness and economic benefit. This is the only way to take to guarantee the participation of various specialists to resolve the problems of Poznan industrial region, exploitation of brown coal and the completion of new construction projects which currently have been causing various doubts. In doing this, we should remember that destruction of ecological values is extremely expensive, should one try to restore the environment and bring it back to its condition before destruction. One should also remember that tourism is an industry that involves the smallest capital investment. Using the values of a territory calls for minimal investment, with the only limiting factor being overpopulation, which, as a matter of fact, is observed in all socio-economic segments.

The problem of protection of rock structures, which is associated with the protection against major hazards in the mining industry, was emphasized by Professor J. Litwiniszyn. The maximum depth at which man can stay and work in a mine currently is around 3000 m. The bore holes reach to a depth of 10 km. In Poland, the depth of coal mines is over 1000 m. The mining processes disrupt the basic balances of rock structures and the rock masses overlying the worked-out open spaces collapse under the force of gravity. The potential energy of these masses and the elastic tectonic energy they contain is converted to other forms of energy, leading to strain, destruction and dislocation of rock beds. The development of a rock mass of a total capacity of around 6 km<sup>3</sup> in the Upper Silesian area has affected not

only the rock beds occurring over the operation levels but also portions of the earth's crust below that level. The developments associated with these activities, the so-called stresses occurring in rocks, are affected not only by strain but also by the speed of deformation, and therefore by the mining intensity. This is illustrated by the operation intensity of the salt bed in Wieliczka, which has been increased several times over after World War Two compared to the preceding 700 years of exploitation of this mine. As a result, if during those preceding centuries the salt bed behaved as a plastic body, resembling, for example, a gradually condensing resin, the intense exploitation after the war has produced in the salt bed and the enclosing rocks such strong stresses that the strata now behave as a brittle body undergoing cracking and destruction and presenting a major safety hazard to the Wieliczka mine.

In postwar Poland, the mining of coal has witnessed an increase of mean operation depth and the rate at which mines advance deeper into the earth's crust. If in the last prewar years the mean rate of increase of mining depth was around 3 m a year and in the early postwar 3-4 m a year, in 1964 it attained 375 m and, in 1980, 550 m. The mean rate of increase of operation depth in this period was 11 m annually. Thus it has increased by three times compared to the early postwar years, and at least until the year 2000 this growth is not likely to slow down.

The increased intensity of extraction of mineral resources in a period of general industrialization in the country is accompanied by certain phenomena that never had a major role in preceding years. These include so-called rock bursts, sometimes with disastrous consequences. Rock bursts generate waves propagating through the rock beds and attaining the earth's surface; like earthquakes, they can endanger structures and other objects on the surface. Increased rates of mining magnify the scope of so-called mining damages in the rock beds and on the surface. It can also cause devastation of deposits which were not developed earlier but will be difficult or impossible to find in the future.

The issue of mining damage is crucial in the Upper Silesian area, because the mining industry development there is accompanied by a huge concentration of population and industrial objects linked with mining. In order to protect the surface and a certain group of underground mines, protection segments are left unmined in the rock beds. In the postwar period, however, the deposits left in those protection segments began to be extracted. In the 1970's, the contribution of coal from these portions accounted for 40 percent of total output. This enabled some of the mines to remain operational for a longer time and helped resolve certain social and economic problems. On the other hand, this operation has caused on the surface and inside the rock structures an increased mining hazard.

The current knowledge of the effects of underground mining on the behavior of the rock beds allows predicting the consequences of mining and the scope of resulting damage and makes it possible to plan time and space characteristics of deposit management in the protection segments so as to minimize

mining damage, ensure normal living conditions in the affected areas, safe operation and at the same time meet the cost effectiveness requirements of mining. During the course of operation and as the depth of mining is increased, it is always necessary to introduce certain corrections of the original plan. Introducing such corrections calls for a detailed analysis of the spatial distribution of workings. Failure to do this analysis or to take into account the ensuing recommendations results in a spatial distribution of workings that creates a labile status of the rock mass, makes it impossible to predict the changes in this state and the hazards it may involve. The intensified pace of mining operation calls for development of modern and streamlined operation technologies.

Greater assistance by science in solving the worrisome problem of increased rock burst hazard was urged by Dr Boguslaw Sewerynski, general director at the Ministry of Metallurgy and Engineering Industries. Help is also needed for developing technologies that would recover from copper ore such metals as molybdenum and vanadium. All other so-called secondary metals whose content makes them worth recovering with the existing state of technology are currently extracted. In particular, silver, occurring as an accessory metal in copper ore, is recovered. In the early years, 2 kg per ton of copper was produced, but currently, because mining is conducted in silver-depleted areas, the output of silver is approximately 650-660 tons of silver per more than 350,000 tons of copper (where about 50 tons or more comes from zinc-tin ores).

According to Dr Sewerynski, the copper industry has drafted a development program until 1990 which is based on the principle of cost effectiveness and has a target output of 440,000 tons annually. The program envisages also outlays on environment protection on a scale coordinated with local authorities. A different situation is observed in the zinc-tin industry, which in 1982 produced 166,000 tons of zinc and 78,000 tons of tin from approximately 5.5 million tons of extracted ore. This allowed exporting, upon fulfillment of domestic needs, 23,000 tons of zinc or associated products such as brass alloys; on the other hand, 6,000 tons of tin had to be imported to satisfy local needs. The industry works at a deficit, selling zinc and tin for official government prices, which are much lower than world market prices, and the mines are incapable of producing under the principle of self-sufficiency, especially since they have to spend large amounts on environmental protection. Maintaining the output of zinc and tin even at its current level calls for major investment into basic modernization, especially as regards environmental protection.

The director of the Department of Oil and Gas Geology at the Ministry of Mining and Energetics Jozef Stemulak offered a broader discussion of the issue of liquid and gas mineral fuels. In the postwar period, practically from the early 1960's, the national economy received more than 90 billion  $m^3$  of gas, including 80 billion  $m^3$  of especially valuable high-methane gas from the Carpathian piedmont region. Currently, the bulk of domestic gas, no longer high-methane but with a high nitrogen content, is produced in Polish Depression. Domestic output, which in 1980 amounted to some 6 billion  $m^3$  of gas and virtually met half of the demand, will drop in 1985 to

about 3.5 billion m<sup>3</sup>. This calls, according to the speaker, for more intense searching for new deposits, as has been decided by government in late 1982. However, there are financial and equipment hurdles to be surmounted by joint efforts of several industrial ministries.

Director Stemulak discussed in general terms the problem of loss incurred during the course of mining operation, pointing out in particular failures to develop proper interpretation of phenomena that occurred in the past decade in the area of updating of geological documentation, as well as the problem of mechanized extraction of minerals from thin beds. He also noted the number of shortcomings in the mining of brown coal, especially in the Poznan Industrial Region. He reported that his ministry, with the participation of the Central Geological Administration and other concerned ministries, has developed already a program of exploitation of brown coal deposits until 1990, which defines the sequence of opening new mines. The speaker emphasized (in conjunction with the expert opinion paper currently being prepared by the Committee on Mineral Resource Management) that greater coordination in timing research projects and industrial work was needed. He said that all documentable deposits of bituminous and brown coal, gas and oil have been documented according to the current state of knowledge. He spoke against the suggestion that local industries be made responsible for extraction of minerals from smaller deposits.

The presented materials and the abstracts have features of a valuable diagnosis, carrying a vast documented pool of data--as noted by Professor W. Gutkowski. For these materials to acquire the value of a forecast that would provide a basis for decision-making, additional data are necessary concerning the extraction potential of the economy. There exists a limit to mining caused by limited investment potential and shortage of labor, equipment and energy, and, finally, the ecological costs. This poses the question as to the share of the gross national product for investment, the percentage that should be allocated for minimum mining operations that is indispensable for the functioning of the economy on the one hand and for maximum operation that would ensure a strong development, taking into account the cost effectiveness principle in a broad sense, on the other hand, the context of the economic reform. Professor Gutkowski pointed out that currently the greatest value can be extracted without any additional investment of personnel, funds or equipment from efficient struggle against waste and resolution of the problem of energy-intensiveness and materials-intensiveness. For instance, for over 20 years scientists and engineers have been saying that Polish machines and equipment are 20 to 30 percent too heavy and that they could design lighter machines. But so far, their efforts to surmount the economic-bureaucratic barriers have failed. This happened because of the principle of estimation: productivity of foundries, steel furnaces, metal factories and steel structure plants has been traditionally measured in terms of thousands of tons of produced or processed material, a principle that has become a deeply rooted practice.

The legislative shortcomings in ensuring the antipollution protection of the atmosphere, the absence of mechanisms that would compel the industries

to install air filters and the need for protecting such natural resources as air, soil and water were noted by Professor S. Bialobok. He pointed out, in particular, that Polish agriculture is suffering huge losses because of the major air pollution problem. About half a million hectares of forests has been either completely destroyed or seriously threatened by industrial emissions. Over half of Poland's territory, the atmosphere pollution level is 20 litrograms of sulfur dioxide per  $m^3$ , which already causes the first degree of damage to coniferous trees. Yet fodder crops, such as vetch, trefoil, lupine and bird's foot have the same tolerance as fir, and barley, rye, millet and oats are as susceptible to pollution as pine (only corn, potatoes and beets have a higher tolerance). Major damages to food production occur from failure to take into account acid rain. The chemical changes in gas composition (mainly sulfur dioxide and nitrogen oxide) damage the crop growth and are dangerous for water collectors. According to Swedish sources, the pH of rain over the entire Polish territory is 4.3 to 4.5. Given the mild Polish winters, this is a dangerous factor; all farmers know what occurs to soil productivity when the soil pH falls below 4.0.

In Katowice Province, potatoes are grown on more than one-third of the province's territory. Since the admissible cadmium and tin content in the soil are exceeded by several hundred times, huge amounts of noxious heavy metals are deposited in the bodies of individuals eating potatoes grown in that area. A similar situation is observed apparently in a large portion of Krakow, Opole, Legnica and Konin Provinces and probably others as well because of considerable wind transport of heavy metals.

The projected productivity growth of farm crops outlined in the expert position paper of PAN's Section V appears overly optimistic. The public at large also has a limited understanding of the dangers to the environment and plant life from various kinds of external factors. It seems that the Polish Academy of Sciences and especially the Scientific Committee on "Man and the Environment" have a major role to play in this area.

Professor J. Znosko, while mentioning the issues of deposit recovery and waste of secondary raw materials, concentrated his communication on environmental aspects. He said that, if the situation of the mining and processing of domestic materials industries can be described as catastrophic, the damage they do to the environment is virtually beyond description. While a crisis can be overcome and the consequences of a tragedy can be corrected, one is forced to witness the continuing day-to-day deterioration of the environmental conditions. In Poland, 27 areas are ecologically endangered. Almost all cities are liable to health hazards mainly because of lower-grade quality (often toxic) water supplies. A great number of examples could be given of deterioration in the natural environment especially aggravated by industrial and farming activity; however, the crux of the matter is the serious danger of further ecological deterioration caused by the improper management of mineral production with unregulated planning and implementation of new projects in opening new mines and developing new processing industries that still are characterized by the typical traits of arbitrary

policies of the past period. The proposed less than 2 percent of investment spending on environmental protection is in fact insufficient even for stemming the process of degradation and is just a drop in the bucket. In Poland, which has one of the best environmental protection laws and at the same time the worst conditions of air, water and soil in Europe, it is mandatory to create an independent environmental protection agency, empowering it to impose rigorous sanctions.

Underscoring the major efforts in developing mining and metal production over the past 30 years, Professor Znosko at the same time noted that the general national structure of mining specialized in extraction of certain minerals without any regard for accessory minerals, and that it was inflexible and not coordinated with processing of domestic raw materials and modern technological requirements and the needs of environmental protection. As a result, paradoxical situations arose--Poland, a powerful producer of mineral-bearing rocks, at the same time imports gypsum, kaoline and chalk and experiences a dramatic shortage of materials in construction, especially for low-story housing. The planning of new mines and processing enterprises must consider the requirements of efficient and comprehensive, possibly wasteless, operation and reclamation, including a full analysis of the loss-benefit balance of a mining enterprise that should incorporate the losses incurred because of damage to the environment, health, farming and forestry.

In conclusion, the speaker suggested that the Academy develop an interdisciplinary expert position paper to offer recommendations flowing from the analysis of the raw material management done by the Committee and translating into the language of specific, practical and adequately coordinated activities along this line: raw materials - exploitation - processing - environmental protection.

Supporting the maxim of Professor Gutkowski that the best investment in the area of material production is putting an end to the continuing major waste in material management, Professor M. Lubinski described the results of a conference of the Committee on Land and Water Engineering of the PAN concerned with saving of energy in the building industry. The conference established that implementing the program of housing construction is seriously threatened by the projected acute deficit of energy for heating of buildings, as even today heating consumes 35 to 40 percent of the entire energy production in Poland. This major consumption, which is not justified technologically and which overloads the national energy balance, results in a situation which--according to the energy forecast for the nation--will lead to a deficit of energy for new housing units. Making the thermal protection of buildings more efficacious and improving the heating efficiency is the only possible way to reduce energy consumption as evaluated per unit of housing stock available in the country. This calls for developing a comprehensive program of efficient utilization of fuels and thermal energy that would include: economic solutions for effective energy distribution and heating of buildings; adequate technologies of heating services; proper material and financial allocations; and a systematic modernization of existing heating installations and systems. If this pro-

gram is implemented, it will allow attaining at the latest by 1990, the so-called zero growth of basic energy consumption in heating of buildings. That would provide the possibility for constructing new projects without the need to increase the fuel consumption for heating, as well as a possibility of shifting some of the planned expenditure on fuel and energy into the investment needs of an altered system of housing construction.

In the framework of the reform, an economic and financial system should be elaborated that would effectively stimulate the introduction by the industry of the output of modern materials, reinforcement and installation equipment, discontinuance of the manufacture of ineffective products of a low quality and short service life, and do away with the faulty system of the 1970's that compelled the overconsumption of materials and energy in our economy by linking the wage funds of an enterprise with its processing capacity, which among other things was measured by the consumption of materials and energy. Efforts should also be intensified to introduce: energy saving solutions in architecture and design; optimum solutions in installation of central heating, ventilation and hot water systems that would enable recording the thermal energy consumption according to the actual individual utilization, and new equipment units that would make it possible to utilize recovered thermal energy; effective systems of automatic control of heating elements in connection with the heat sources and variations in the energy use by individual consumers, utilizing central heating, ventilation and hot water supply; a modern, stable and reliable structure of equipment used for measurement of heat energy used by consumers, units for automatic control of central heating, ventilation and hot water systems and also materials and elements for insulation, wires, pipes and equipment. Implementing these projects will result in a great saving of energy and raise the efficiency of national economic management.

Professor B. Baranowski, proceeding from the resolutions adopted by the conference at Jablonna, "Chemistry for Agriculture," dwelt on two issues. First, he spoke of the annual deficit of methane in nitrogen industry to the tune 0.5 billion m<sup>3</sup> annually, resulting in the underutilization of productive capacities, and a shortage in output equal to some 400,000 tons of fertilizer, which in turn is tantamount to a loss of 4 million tons of grain annually. Secondly, the chemical industry could manufacture herbicides that would limit, if not eliminate, 10 to 30 percent of losses caused by weeds in our soil, according to calculations by agronomists. This, however, would call for appropriate investment in physical plant. The high-tonnage production of the chemical industry is energy-intensive, while low-tonnage products require the use of special equipment not always available from domestic producers. Professor Baranowski suggested holding a session of the PAN General Assembly dedicated to problems of farming which was originally scheduled for December 1981 and postponed, although the Committee for Chemical Sciences had been actively preparing for it.

Speaking of the resolutions of another conference--organized in 1982 by the Committee on Regional Management of the Nation to discuss the management of natural resources--Professor S. Kozlowski stated that the project

of national industrial development adopted after World War Two and considered as a guide for implementation even today fails to put into consideration the actual natural conditions of Poland, especially its soil and climatic factors favorable for agriculture. This plan, on the contrary, involves heedless exploitation and consumption of natural resources which in the past few years involved overstepping the endurance limits of the environment, natural values, water reserves and forests.

Excessive extraction of such materials as copper, sulfur, zinc and tin will lead to a situation where in 50 to 60 years these minerals will disappear from Poland's bank of natural resources. And yet we continue to exploit these resources and plan mining, as, for instance, in output of copper, where, from the current 340,000 tons of electrolytic copper, the output is expected to be brought up to 440,000 tons in 1990. All this is happening in conditions where this exploitation is creating one of the largest areas of ecologic disaster in Poland, where the procurement of food products from areas surrounding Legnica and Glogow metal works had to be banned. The system of coal mining that does not allow utilizing thin measures, thick measures and oblique seams results in a waste of reserves, reduced operational life of existing mines, the building of new mines and the resulting further damage to the environment. A case in point is the building in the area near Leczycko-Wlodawskie Lake of a new Lublin Mine Enterprise, which endangers the water system of the Lublin area, particularly sensitive in this respect. For this group of materials, an output ceiling should be established in the framework of a national policy rather than within one ministry.

Another group of materials are those that are in short supply in the economy--construction mineral materials, road-building stone, lime and magnesium fertilizer for farming. The deficits are exacerbated by the absence of a permanent agency that would control the principles of protection of deposits and be responsible for adequate material management. Mineral resources, for instance, are managed by 19 ministries and central agencies.

Construction gigantomania leads to major ecologic danger in all new mining development areas, including Rybnik, Legnica and Checin, and creates the potential of danger in the Suwalki area, Lublin coal basin, Poznan Industrial Region and the Olkusz district (the acute conflict between the zinc-tin deposits and the Jurajski National Park).

The frightening pollution of flowing, stagnant, marine and ground water in Poland will produce an acute deficit of water as early as in the 1990's. Rapacious exploitation is carried on in forests, where the amount of timber output exceeds the recovery growth. This is accompanied by widespread waste of lower-grade trees. On the other hand, economic reform intensifies the misuse of natural resources by largely eliminating the mechanisms for conservation of the environment. This is so, because the industrial enterprises concerned about costs have no incentives to introduce environmental protective measures, including air and water treatment.

The breakdown of basic functions and resistance of the natural environment may lead to a second, much more serious, phase of the crisis, when it will become imperative to undertake huge expenditures to save the situation.

For this reason, most urgent today are actions to prevent the occurrence of such a second phase. One such action would be to develop a concept of central agency--a ministry of environmental protection, geology and water management. Thus far, however, such a concept has not been accepted.

Professor T. Nowacki spoke of vegetable raw materials and their energy value. He proposed a new concept for measuring both the energy carriers and products obtained by their processing, concluding that agriculture could be viewed as a branch of national power production. The output of vegetable materials in terms of energy greatly exceeds the output of minerals in Poland. While continuing the search for and processing of mineral materials, it is necessary to intensify scientific research and promote educational and organizational measures to raise the level of production and improve utilization of vegetable materials. Holding a session of the Academy on problems of agriculture is fully justified in this respect as well.

Professor M. Nikonorow reported the results of a major study by the Committee on Human Ecology that contains analysis and evaluation of Poland's health demographics. Proceeding from these analyses and giving examples illustrating deterioration of the quality of food products, especially milk, which no longer can be used to prepare infant food, the speaker noted that environmental protection is necessary above all for the youngest population groups--children and infants. Certain elements dangerous to human health are in fact consumed by the population in amounts exceeding admissible levels recommended by the World Health Organization.

Professor S. Mrowec said that gasification of coal, which extracts from coal gas intended not only as a fuel but also as material for other end-products, is an issue that has been resolved technologically. There remains, however, a major material problem posed by the equipment used for gasification in view of damage to the environment that it involves. Yet, it is necessary to intensify research to find ways of utilizing the diminishing reserves of coal in Poland, primarily by profound processing, including gasification.

In conclusion of the session, the presenter, Professor R. Ney, commented on suggestions made during the course of the discussion and thanked the speakers for the amendments to materials of the Committee and suggestions promoting a comprehensive solution of extremely difficult and complicated problems of mineral production.

Upon a motion advanced by the Vice President of the PAN, Professor L. Sosnowski, the General Assembly approved the "Resolution no 1/83 on Recommendations Concerning the Utilization of Mineral Resources."

"The PAN General Assembly, having heard the paper presented by the PAN corresponding member R. Ney entitled 'Utilization of National Mineral Resources,' and having conducted a discussion of this presentation, has resolved to:

- 1) accept the suggestions contained in the presentation;
- 2) commit to Section VII of Earth Sciences and Mining Sciences of the PAN to prepare a synopsis of information on this subject for the government; and
- 3) request the PAN Presidium to dedicate to this issue a special session with the goal of approving a program of subsequent work in the area of management of mineral resources in the broad sense of the term, including an interdisciplinary coordination with the scopes of activity of the respective PAN sections."

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CSO: 2600/736

POLAND

AGING INLAND WATERWAYS INFRASTRUCTURE IN Odra BASIN SURVEYED

Warsaw PRZEGLAD KOMUNIKACYJNY in Polish No 1, Jan 84 pp 12-19

[Article by Marian Pawlak: "Infrastructure of Inland Water Transport in the Odra Basin"]

[Text] The technical condition of structures on waterways that serve for water flow regulation in the Odra Basin is unsatisfactory. The situation, however, varies on individual rivers and even on different segments within one river.

Two types of technical facilities are involved in maintenance, operation and technical renovation--regulation and safety structures of river channels and hydrological construction objects such as dams, locks, ports, loading piers, etc.

While water regulation structures require continuing efforts for conservation and repair of damages, and, after a certain period of time, renovation (the rebuilding of structures), the hydrotechnical structures mainly require maintaining mechanisms and equipment in an operative condition. Structures built of concrete call for reinforcement efforts, and, after certain periods of time, demolition and rebuilding up from the foundation.

The regulation of the Odra at medium water level was basically completed back in 1884, but regulation for low water level was started only after the catastrophically dry year of 1922 and has not been completed in its entirety even today.

Water locks were built on the Odra mainly for navigation in two stages--namely, on the segment from Kozle to the confluence with the Nysa Kłodzka in 1891-95 and on the segment from the Nysa Kłodzka to Wrocław in 1907-18; water locks were built on the former segment. In 1922, another water gate was built in Rzędzin below Wrocław.

After rebuilding of structures destroyed during the war, the channeled segment of the Odra was increased by the building of just one water lock, at Brzeg

Table 1. Estimated Cost of Maintenance and Repair of Odra Waterways

<u>Work item</u>	Outlays (million zlotys)			<u>Remarks</u>
	<u>before 1985</u>	<u>1986- 1990</u>	<u>Total</u>	
<b>Gliwice Canal and Kedzierzyn Canal</b>				
Locks (structural, mechanical and electrical parts)	74.0	52.0	126.0	Including Kedzierzyn Canal until 1985
Bank reinforcements	128.0	160.0	288.0	
Technical facilities	81.0	161.0	242.0	
Dredging work	80.0	50.0	130.0	
Subtotal	363.0	423.0	786.0	
<b>Channeled segment of the Odra</b>				
Small locks (bringing into operation and mechanization)	96.1	-	96.1	
Large locks (structural and electric elements, standardization and modernization of locking devices)	405.0	395.0	800.0	Excluding hydraulic drives
Lock approach pools (bank reinforcement)	80.0	104.0	184.0	
Canals (bank reinforcement for traffic)	80.0	112.0	192.0	
Rebuilding of separation dams	24.0	60.0	84.0	
Water control work	210.0	240.0	450.0	
Lock approach guides	88.0	-	88.0	
Dredging work	94.0	95.0	189.0	
Current dam repair	50.0	60.0	110.0	
Subtotal	1027.1	1066.0	2193.1	
<b>Free-flowing Odra segment</b>				
Rebuilding control facilities	325.9	523.6	849.5	
Reconstructing control facilities	40.0	80.0	120.0	
Water structures	70.0	70.0	140.0	
Dredging work	323.0	277.0	600.0	
Subtotal	758.9	950.6	1709.5	
Direct costs	2249.0	2439.6	4683.6	

Dolny, completed in 1958. The construction work done in 1966-70 included the Kedzierzyn Canal and port at the Nitrogen Enterprises at Kedzierzyn, the cement port at Chorula and the Metalchemia port at Groszowice, as well as partial modernization of Gliwice and Warsaw ports and large-scale repair of the Kozle and Malczyce port facilities.

In the 1970's, modernization of the upper Odra cascade was begun. By now, piers have been reconstructed at: Kozle, Januszkowice, Krepa, Wroblin, Zwanowice and Rozanka. Under construction are piers at: Krapkowice, Groszowice, Opole, Dobrzen, Opatowice and Janowice. In addition, a new water lock is being built at Zwanowice, and the digging of the river bed near Mlynkow on the free-flowing Odra is nearing completion.

The management system of the basin of the upper and middle Odra and Warta and Noteć has been developed in its current form near the turn of the century. After major floods in 1897 and 1903 that caused huge damage, especially in the basin of the upper and middle Odra, many decisions were made that determined the program of regulational construction and the building of reservoirs; the chief goal was flood control and also, partially, energy uses. The program was intensely implemented in 1905-13 and continued until 1929. More than 70 percent of the infrastructure was created at that time.

In 1962-81, on the left Odra confluents, the program of renovation and repairs involved building from scratch facilities for river and stream regulation covering 546 km; the major projects included:

- building from scratch the regulation facilities on the right bank of the Nysa Luzycka--190 km, or 30 percent of the river's length;
- rebuilding from the foundation the correction stages on the Kwisa--139 km, or 90 percent of the river's length;
- rebuilding from the foundation the regulation facilities of Kaczawa--90 km, or 50 percent of the river;
- building from the foundation the regulation facilities on the Biala Ladecka and Bystrzyca Dusznicka mountain streams;
- the building of reservoirs: "Nysa" on the Nysa Klodzka, capacity 113.6 million cubic meters; "Slup" on the Nysa Szalona, capacity 40.5 million cubic meters; and modernization and adaptation to constant leveling of the Kaczorow Reservoir, capacity 1.1 million cubic meters.

Of the major projects completed after the war in Warta and Noteć Basins, the following should be mentioned:

- regulation facilities built from the foundation on navigable segment of the Warta, 58.6 km;
- regulation facilities built from the foundation on the nonnavigable segment of the Warta, 65 km;

Table 2. Activity Scopes and Costs of Recovery of Adequate Technical Condition by Navigation Routes of the Warta and Noteć--including the Slesin Canal

	Costs (million zlotys)		
	<u>until 1985</u>	<u>1986- 1990</u>	<u>total 1990</u>
<b>Warta River</b>			
River control construction:			
--carrying out backlog work	290.00	290.00	580.00
--current maintenance and repairs	260.00	260.00	520.00
Dredging work:			
--carrying out backlog work	2.59	26.00	2.59
--current work	26.00	26.00	52.00
Subtotal	578.59	576.00	1154.59
<b>Noteć River</b>			
River control structures:			
--carrying out backlog work			
lower free-flowing segment	26.00	-	26.00
channeled lower segment	71.00	71.00	142.00
channeled upper segment	36.00	36.00	72.00
--current maintenance and repairs			
lower free-flowing segment	56.00	56.00	112.00
channeled lower segment	152.00	152.00	304.00
channeled upper segment	48.00	48.00	96.00
Dredging work:			
--carrying out backlog work	17.30	-	17.30
--current work	21.96	21.96	43.92
Hydroengineering objects:			
--current maintenance and repair			
lower channeled segment	17.32	17.32	34.64
upper channeled segment	14.22	14.22	28.44
--modernization:			
--introduction of electric power units at locks and dams on lower segment	44.44	44.44	88.88
--replacement of pumps & pumping stations	1.33	1.33	2.66
<b>Slesin Canal</b>			
hydroengineering objects--current maintenance	4.22	4.22	8.44
Subtotal	509.79	466.49	976.28
Total	1088.38	1042.49	2130.87

- building regulation facilities on the Gwda, 5.5 km;
- building the Pakosc Reservoir on the upper Note, capacity 45.5 million cubic meters;
- partial reconstruction and modernization of the Ujscie, Krzyz and Kostrzyn river ports.

All these works do not change the general situation on waterways and other rivers. The hydroengineering objects, the auxiliary structures and technical facilities are all severely worn down. This situation was largely a result of gradual decrease in spending on maintenance repair. Especially damaging was the stripping of river management of their own working facilities.

#### Brief Description of Waterways, Streams, Commercial Ports and Transshipping Facilities

Total length of rivers in the Odra Basin equals 5,088 km, including: navigable rivers, 1,457.7 km (navigable channels 103.5 km); nonnavigable rivers, 2,225.3 km; and mountain streams and creeks, 1,408 km.

#### Navigable Waterways

The Odra is used for navigation from Kozle to Szczecin on a stretch of 643 km. Depending on variations in hydroengineering, construction and maintained depth it is subdivided into three segments:

- on the segment from the upper channel of the Odra from Kozle (96.5 km) to Brzeg Dolny (282.6 km) there are 23 stages with long locks  $186 \times 9.6 \times 2.5$  m and  $225 \times 12.0 \times 3.0$  m and small locks measuring  $55 \times 9.6 \times 2.6$  m; 5 of the stages have only long locks; this segment belongs to class II of waterways with guaranteed depths of 180 cm;
- the segment of the free-flowing middle Odra regulated from Brzeg Dolny to Warta confluence (617.6 km) belongs to class II of waterways with a guaranteed depth of 130 cm--for 290 days a year;
- the segment of the lower Odra, a free-flowing regulated waterway from Warta to the river mouth to Dabie Lake belongs to classes II and III of waterways with guaranteed depth of 200 cm--throughout the navigation season.

The Odra waterways also includes the Gliwice Canal (41 km long), as well as the 6 km branch of the Kedzierzyn Canal. The Gliwice Canal has six stages, each with two locks, measuring  $72 \times 12 \times 3.5$  m.

#### Warta

Warta as a waterway is 406.6 km long. Only the lower segment 68 m long belongs to class II of waterways and is largely used by boats of 130 cm draft. At the upper reaches of the river, after Lubon, near Poznan, regular navigation

is possible only with drafts from 80 to 100 cm at the medium water level, with a maximum of 150 cm at medium level. The remaining portions of the river belong to class I of waterways.

#### Notec

The Notec River as a waterway is 301.6 km long, and, depending on the hydro-engineering development, is subdivided into segments:

- upper Notec with channeled waterbed on 114.6 km including eight navigation locks measuring 42 x 5.0 x 1.5 m; 12 dams; 1 collector; 2 barrage dams and 1 pump station. This segment belongs to class I of waterways;
- lower Notec channeled, length 137.1 km, with 14 navigation locks measuring 57.4 x 9.6 x 2.3 m and 16 dams. The segment belongs to waterways class II, with depth 140 cm at medium water level and depths to 120 cm at low water levels;
- the lower free-flowing segment of the Notec, regulated length 49.8 km, belongs to waterways class II, with depths 140 cm at medium water level and up to 120 cm at low water levels.

#### Slesin Canal

This canal, 32 km long, is part of southern connection between the middle Warta near Konin and the upper channeled portion of the Notec, which has direct connection with Bydgoszcz Canal. The canal has four locks 59.6 x 9.6 x 2.2 m, one dam, two pump stations and one floodgate.

The segment has been excluded from navigation for several years and temporarily "stopped" by road embankment serving the nearby brown coal mines.

#### Bydgoszcz Canal

This canal is 24.5 km long and makes part of the waterway linking Wisla and the Odra; on the Wisla side it is connected to a segment of the channeled Brda, 14.4 km long, which belongs to the Wisla Basin. The canal has five locks 57.4 x 9.6 x 2.3 m and belongs to class II of waterways with depth of 200 cm. Remarkably, the watershed separating the Odra and Wisla Basins runs through this canal at the connection of the upper Notec segment with the canal; the entire system is managed by the Poznan Water Management Office.

#### Other Nonnavigable Rivers and Mountain Rivers and Creeks

The total length of nonnavigable rivers and mountain rivers and creeks in the area of the Odra Basin now managed by the Wroclaw and Poznan Water Management Offices is 3633.3 km.

The length of streams and rivers as subdivided among the individual District Water Management Offices is as follows: Wroclaw Office, nonnavigable rivers

1535 km, mountain rivers and creeks 1408 km; Poznan Office, nonnavigable rivers 690.3 km.

In the Odra Basin, the major nonnavigable rivers, according to administrative divisions, are: Wroclaw Office, Nysa Luzycka (193 km), Bobr (263 km), Kwisa (134 km), Kaczorow (90 km), Bystrzyca (106 km), Nysa Kłodzka (179 km), Mala-panew (114 km); and Poznan Office, Prosna (153.7 km), Gwda (88.0 km), Drawa (170 km) and Pilawa (48.0 km).

The Wroclaw Water Management Office in 1981 registered 1531 km of waterways regulated or not requiring regulation, with the remaining 1412 km subject to water management development. The average cost of regulating 1 km of non-navigable river or mountain stream is around 10 million zlotys.

In the Poznan Office, development work has to cover 182.7 km to attain complete regulation of the rivers in the area.

#### Reservoirs

The Odra Basin contains multiple-function reservoirs (six, with a total capacity of 547.1 million cubic meters and utility reservoirs with a capacity of 400.8 million cubic meters), flood control reservoirs (dry, 10, total capacity 25.1 million cubic meters) and energy reservoirs (5, total capacity 89.8 million cubic meters and utility 63.1 million cubic meters).

Under construction are the following reservoirs:

##### ■ Wroclaw Water Management Office:

--Mietkow Reservoir on the Bystrzyca, total capacity 70 million  $m^3$ , estimated cost 2415 million zlotys, completion 64 percent;

--Dobromierz Reservoir on the Strzegomca, capacity 11.65 million  $m^3$ , estimated cost 768 million zlotys, completion 57 percent;

--Bukowka Reservoir on the Bobr, capacity 16.75 million  $m^3$ , estimated cost 906 million zlotys, completion 27 percent;

--raising the dam on existing Turawa Reservoir, capacity of 107 million  $m^3$ , so as to increase the capacity by 8 million  $m^3$ , estimated cost 147 million zlotys, 86.4 percent of project thus far completed.

##### ■ Poznan Water Management Office:

--Jeziorsko Reservoir on the Warta, total capacity 203 million  $m^3$ , estimated cost 3413 million zlotys, completed 61 percent;

#### Commercial Ports and Loading Facilities

Ports and enterprise loading facilities make part of the infrastructure of waterways, and their condition is one of the factors determining the level of development of water transport and management of navigable rivers.

In the period preceding the return of the Odra region to Poland, the network of loading facilities was well developed; inland waterways were therefore used for transportation of various commodities. Almost every industrial enterprise, every township and even every village used water transport. Altogether, about 30 ports existed on the Odra, plus a great number of transshipping yards. Many of the parts had excess transshipment capacity--a normal phenomenon observed even now in nations with a high level of development of transport, especially waterways.

The existing, less numerous commercial ports on the waterways under discussion handle mostly bulk cargoes such as coal, gravel, ore, phosphorus materials, fertilizer, etc. Unitized loads hardly account for 1 percent of the total. Industrial enterprise transshipping yards almost exclusively handle bulk loads, while unitized cargoes are handled only occasionally.

#### **Public Commercial Ports**

The commercial ports on waterways in the Odra Basin are managed by navigation authorities, called Odra Navigation and Bydgoszcz Navigation Authorities.

The Odra Navigation Authority has eight ports located on the upper and middle Odra: Gliwice, Kozle, Opole, Wroclaw Miejski, Popowice, Malczyce, Cigacice and Nowa Sol (Olawa and Scinawa ports are currently inoperative). In addition, it has transshipping yards at five ports in flooded areas (Zatoka Pomorska) in the localities: Stepnica, Wolin, Kamien Pomorski, Dziwnow and Wicko, and a large number of leasehold piers in the area of Szczecin-Swinoujscie portal facilities.

Bydgoszcz Navigation Authority has three commercial ports: Kostryzyz, Krzyz and Ujscie. The existing port in Poznan will soon be dismantled because of the technical condition of the landing piers and the city requirements.

#### **Industrial Ports and Trans-shipping Yards**

On the waterways under discussion, there are 32 operative or temporarily operative industrial ports and landing stages. This includes 29 transshipping yards on the Odra, including the facilities in the Szczecin-Swinoujscie portal region. The ownership of these facilities is distributed among enterprises subordinated to seven ministries.

The number includes all operative grain elevators, namely, seven.

#### **Problems of Depreciation of the Basic Infrastructural Objects of Waterways and Streams in the Odra Basin**

It is currently impossible to evaluate the total worth of facilities involved in water management in the Odra Basin due to a lack of inventory lists and the absence of the necessary data.

Based on available partial data, one can calculate only general estimates that provide a general notion of the quantities involved. Based on earlier inventories and estimates, the following values are assumed:

- waterways of the Odra River, according to the 1964 inventories--10 billion zlotys, current value 50-60 billion zlotys;
- hydroengineering structures of nonnavigable rivers and mountain streams under the Wroclaw Water Management Office--3.5 billion zlotys, current value 17-19 billion zlotys;
- hydroengineering structures of nonnavigable waters under the Poznan Water Management Office, similar to the estimates for the Wroclaw area; initial value of properties of commercial ports on the Odra, 0.7 billion zlotys.

We have mentioned earlier in this paper that the age of waterways and structures in the Odra Basin is such that most of these objects have reached the threshold of their service life and are largely worn out. The degradation of the facilities has also contributed to the decisions whereby conservation and maintenance work was not done in due time and to the proper extent.

#### Odra

##### Upper Channels of the Odra

The basic problem on the channeled Odra is the technical condition of lock chambers. There is a real hazard of breakdowns that can stop navigation. Another issue is maintaining the proper transit depth of 180 cm, because the prewar channels ensure a depth of just 150 cm.

The following issues have to be resolved in recovering the proper technical status of waterways:

- flight locks--structural part: reinforcing the walls and heads of lock chambers by cementing (completion of work started in 1970); reinforcing walls by the use of proper masonry; restoration and renovation of bollards; these structural problems do not refer to Janowice II, Redzin II and Brzeg Dolny locks--which are relatively new--and Zaczise lock, which was overhauled in 1972;
- flight locks--mechanical part: standardization of locking devices (gates, bypass channels); modernization of motors; repair of electric installations;
- lock approach pools--securing the walls on 23 locks, securing walls of approach canals on a total length of approximately 24 km;
- change of existing structure of leading entry jetties on 22 locks;
- reconstruction of bank guards and control structures on waterways of a total length of approximately 75 km;

- regular dredging operations, especially on entry to approach pools and some lock canals, totaling 300,000 m<sup>3</sup>;
- switch to electric drive on smaller locks (14 units).

#### Free-Flowing Segment of the Odra

On the middle and lower segments of the river, the problems of maintaining waterways are similar, so that these two areas are discussed together. Major work to be done here includes the following: rebuilding bank guards and control installations on the Brzeg Dolny-Bielinek segment with a total length of around 110 km; rebuilding bank guards (bank reinforcement) below Bielinek on a total length of about 20 km; intensifying dredging operations to a total of 420,000 m<sup>3</sup>. It should be pointed out that, unless these works are initiated in due time, a further increasing destruction of banks will occur, leading to disruption of riverbed stability and increased navigational difficulties. A special issue is the heavy bottom erosion below the last lock at Brzeg Dolny. Recent calculations indicate that the bottom of the Odra after the lock was built is being eroded at a rate of 7.9 cm annually. The erosion on the 10-km segment immediately adjacent to the lock--on separate kilometer-long segments as compared to 1930--varies from 2.25 to 3.46 m. This calls for building the Malczyce lock and at the same time the next lock near Lubiaz.

#### Gliwice Canal and Kedzierzyn Canal

Maintaining the canals in proper technical condition involves primarily the following operations: replacement of drive mechanisms and installations on locks; bank reinforcement construction on a total length of around 35 km; conducting regular dredging, with a total quantity of work estimated at around 200,000 m<sup>3</sup> (without Gliwice port).

On the Kedzierzyn Canal, bank reinforcement and dredging work are necessary.

#### Warta

Technical degradation on the Warta is mainly due to disrepair of control installations: some 20 percent of bank reinforcements require overhaul. Basic flow control installations are destroyed. Cross-dams fail to fulfill their functions, because lock heads and bodies have been destroyed. This results in a situation similar to that on the free-flowing segment of the Odra, so that, because it is impossible to support the water level from reservoirs, the navigation is totally determined by natural flow and depth as shaped by the remaining elements of the control structures. The breakdown of control structures also results in local shifts of the riverbed, which gradually absorbs areas used as meadows and pastures.

#### Notec

Due to reduced intensity of navigation traffic and also more regular conservation and repair efforts, the condition of hydroengineering objects, especially

locks, is slightly better than on the channeled segment of the Odra. Yet, the following facts indicate continuing technical degradation:

- most lock channels and approach pools are silted permanently;
- on segments between locks, silting also appears, which, due to the need to ensure adequate depth for navigation, results in flooding of adjacent farmlands (meadows and pastures);
- destruction of faceplates and cracking of headwalls of locks due to collisions with boats (locks are not equipped with leading jetties);
- the lock drives are archaic hand-driven mechanisms;
- many segments of the waterway running through the natural riverbed have the passage width of 200 to 400 m and sometimes as small as 100 m, although navigation requires about 650 m;
- the water control structures on some 20 percent of the bank line require major overhaul.

Other Nonnavigable Rivers and  
Mountain Streams and Creeks  
(Wroclaw Water Management Office)

In the past decade, outlays on maintaining the existing hydroengineering facilities averaged 400 million zlotys annually, compared to the requirement of 600 million zlotys in 1978 prices. The lack of funds made it impossible to prevent natural depreciation. In such a situation, any major flood tide led to an avalanche-like increase in damages. Allocations for flood control through the building of reservoirs are also insufficient.

A special factor responsible for continuing deformation of areas of riverbeds and mountain streams, which has direct influence on the degradation of arable soils and flood damage, is the practice of rapacious extraction of gravel on areas of farmlands in the direct vicinity of riverbeds; this operation is done by groups on a day-to-day basis without constructive investment. This activity is observed primarily in valleys of submontane rivers, especially the Nysa Kłodzka, Nysa Luzycka and Bobr. Due to numerous floods in the Odra Basin in 1977-81, the riverbeds sometimes moved over into these quarries, and the ensuing heavy erosion brought large amounts of sediment to the lower reaches of rivers, where it settled. The process was further intensified due to excessive erosion of unfortified banks.

Other Nonnavigable Rivers (Poznan  
Water Management Authority)

The technical degradation of these rivers is a result of the decay of water control structures. This has led to local changes of river channels within the riverbed areas, entailing reduced utilization of these areas for pastures

Table 3. Scope of Activities and Costs for Recovery of Adequate Technical Condition and Maintenance of Nonnavigable Rivers and Mountain Rivers and Streams

	Costs (million zlotys)				
	<u>Annual</u>	<u>until 1985</u>	<u>1986- 1990</u>		<u>Remarks</u>
<b>Nonnavigable rivers</b>					
River control construction					
current maintenance and repairs	180.00	720.00	720.00	Wroclaw Office	
current maintenance and repairs	31.00	124.00	124.00	" "	
carrying out backlog work	22.50	90.00	90.00	Poznan Office	
new river control construction	40.00	160.00	160.00	" "	
Hydroengineering objects					
current maintenance and repair					
--reservoirs (4 units)	20.00	80.00	80.00	Wroclaw Office	
--dams	1.00	4.00	4.00	Poznan Office	
	(until year 2000)				
Subtotal	294.50	1178.00	1178.00	Wroclaw Office	
 <b>Mountain rivers and streams</b>					
River control construction					
current maintenance and repairs	389.00	1556.00	1556.00	Wroclaw Office	
Hydroengineering objects					
current maintenance and repairs					
--multifunctional reservoirs (10 units)	1.00	4.00	4.00	Wroclaw Office	
--flood control reservoirs (10 units)	10.00	40.00	40.00	Wroclaw Office	
--construction of antisilting reservoirs	-	400.00	465.00		
Total	400.00	2000.00	2065.00		

and increased amounts of sediment brought to main streams--including the navigable segments.

#### Commercial Ports and Landing Stages

The quantity, structure and utilization of basic installations of commercial ports and landing stages near Szczecin managed by the Odra Navigation Authority have been described in a report issued by this organization. For the other ports and loading facilities, no such material is available, and only limited examples can be given.

#### Commercial Ports on the Odra River and Some Loading Facilities in the Szczecin Area

Investigations suggest that the pattern of available elements of the technological infrastructure at ports as related to the total worth of capital assets is as follows: buildings 13.68 percent, structures 41.98 percent, machines and equipment 44.43 percent.

A large degree of wear and tear of basic stock of Odra ports concerns mainly the group of machinery and equipment and is equal to 64.18 percent; most cranes have been depreciated over their value, because they have been in operation for a period of from 25 to 60 years and more. In the group of hydroengineering structures (mainly embankments), the degree of depreciation, compared to the initial value is, for instance, at Malczyce 77.5 percent, at Opole 55.06 percent and at Kozle 46.71 percent.

As far as port buildings and structures are concerned, the need for modernization also stems from the requirements of adapting them to the binding structural, fire safety and engineering regulations.

#### Loading Facilities on the Odra and Other Navigable Rivers

The technical condition of loading facilities varies in a wide range. They were mainly constructed at the beginning of the century, and for this reason, and especially because of the absence of proper repair work, most have been devastated by use. Most loading facilities are of a low capacity, worn and practically should be brought out of operation.

#### Definition of Necessary Outlays

In order to stem the continuing depreciation and technical degradation of hydroengineering infrastructure of the Odra Basin and to restore the proper technological condition of waterways, the works mentioned above should be carried out. Implementing these efforts will be possible only with the adequate financing and supply of materials and labor.

Table 4. Costs of Maintenance, Rebuilding and Repairs of Commerical Ports and Transshipping Facilities (million zlotys)

<u>Item</u>	<u>Hydroengineering construction</u>	<u>Transshipping facilities</u>	<u>Transportation roads &amp; costs</u>	<u>Equipment facilities</u>	<u>Subtotal</u>
<b>Commerical ports (until 1985)</b>					
Continuation of ongoing projects	20.0	70.0	23.0	155.0	269.0
Rebuilding & repairs	128.5	187.4	108.0	81.0	504.0
Subtotal	148.5	257.4	131.0	236.0	763.0
<b>Loading facilities (until 1985)</b>					
Rebuilding and repairs	94.0	303.6	81.9	61.5	541.0
<b>Loading facilities (1986-199)</b>					
Rebuilding and repairs	84.0	138.3	15.0	42.0	279.8
Total					820.8

Table 5. Composite Financial Estimates

<u>Item</u>	Costs (million zlotys)		
	<u>until 1985</u>	<u>1986-1990</u>	<u>Subtotal</u>
Odra maintenance and repair	2,249,000	2,439,000	4,698,600
Warta maintenance and repair	578,590	576,000	1,154,590
Notec maintenance and repair with necessary modernization	509,790	466,490	976,280
Nonnavigable rivers maintenace & repairs	1,178,000	1,178,000	2,356,000
Mountain streams maintenance & repairs	1,600,000	1,600,000	3,200,000
Reservoir construction	400,000	465,000	865,000
Commerical ports and transshipping units	922,000	820,800	1,742,800
Mooring shipyards	75,000	60,000	135,000
Total	7,512,380	7,605,890	15,118,270

including the construction  
of Malczyce lock and rebuild-  
ing of dams on the Odra            19,332,270

Despite the crisis in the country, recovering the proper technological conditions is necessary. If the current situation persists, it will lead to further destruction of national wealth in the sphere of water management and also will have damaging effects on other branches of the economy.

The necessary regular spending according to areas of activity is shown in Table 1 for a 10-year cycle. Major needs in repair and reconstruction will not allow reducing this time period, and one can even say that it is rather optimistic. It seems that, only if repair and conservation work is conducted directly by river management administrations, the outlined programs will be implemented. It is important that preventive activities and efforts to recover the technical level should be conducted simultaneously. After completion of this work, conservation, maintenance and repair should be regular, and work by the forces of water management administrations should be done on a full scale.

Financial estimates are given in 1978 prices. The total spending necessary today to recover the proper technological condition of hydroengineering infrastructure of the Odra Basin is estimated at 19,332.27 million zlotys.

This amount does not include the set of measures necessary to prevent flood damage, bank crumbling and water pollution control.

#### Conclusions

- The depreciation and continuing decay of the hydroengineering infrastructure of the Odra Basin requires (practically immediately) major repair and maintenance efforts.
- Due to inadequate capacity of existing enterprises performing until now these functions in water management construction, it is necessary to create special working units for maintenance and repair work by water management agencies.
- Major construction work and repairs should be continued to be performed by specialized enterprises, which must concentrate on such projects.
- The basic construction projects under way should not be slowed down. Efforts must be applied to increase the pace of work and improve the performance quality of structures such as reservoirs and dams.
- Methods of measurement of river channels and riverbeds should be improved to obtain exact and fast data on riverbed stability, active cross-section, etc.
- In order to provide reliable and available flood control, sufficient numbers of icebreaking machines should be installed at crucial locations.
- New technologies should be introduced in safety efforts to ensure increased pace of work and better longevity of structures.
- Studies should be done to evaluate the cost-effectiveness of energy production development on modernized Odra dams.

ROMANIA

DECREE ON EXCHANGE RATES, AMORTIZATION, INTEREST, OIL PRICES

Bucharest BULETINUL OFICIAL in Romanian Part I No 14, 21 Feb 84 pp 1-3

Decree of the State Council on Some Measures in the Field of Exchange Rates, Amortization, Interest and the Price of Crude Oil

Text The State Council of the Socialist Republic of Romania decrees:

Article 1. The commercial exchange rate for \$1.00 U.S., on 1 January 1984, is set at the level of the commercial exchange rate existing on 31 December 1983, recalculated by dividing by 0.85 U.S. dollars.

Paragraph 1 of Article 1 and Point 2 of Appendix No 1 in Decree No 235/1983 on Some Measures in the Field of Exchange Rates and of the Delivery Price of Natural Gas are amended accordingly.

Article 2. Appendix No 1 to Decree No 234/1974 on the Bank Interest, Commissions, Fees and Charges in Dealings with the Socialist Units, Other Juridical Persons, and Physical Persons, as it was amended and replaced by the appendix to Decree No 458/1982, published in BULETINUL OFICIAL, No 119, 1982, is amended with respect to the bank interest for the socialist units in accordance with the appendix, which is an integral part of the present decree.

Article 3. The standard service lives of the fixed assets belonging to the state economic units in the machine-building industry, in categories 3, 4 and 5, stipulated in the Catalog of Amortization Rates and Standard Service Lives of Fixed Assets in Appendix No 1 to Law No 62/1968 on the Amortization of Fixed Assets, republished in BULETINUL OFICIAL, Nos 6-7, 1977, with the later amendments, are reduced, from 1 January 1984, by 15 percent.

The Ministry of Technical-Material Supply and Control of the Management of Fixed Assets, the State Planning Committee and the Ministry of Finance will examine the standard service lives of the fixed assets and will present proposals for updating them by 30 September 1984.

Article 4. The state economic units have the obligation to pay a tax on the funds received from the budget for investments. The tax is owed beginning with the month after the respective facilities go into operation, up to the complete repayment of the funds received.

The annual amount of the tax is set at the level of the interest provided by law for current loans for investments.

The tax on the funds received from the budget for investments is calculated, is borne and is paid in accordance with the legal standards set for the interest on current loans for investments.

Article 5. The average delivery price of the crude oil from domestic production is set, from 1 January 1984, at 1,750 lei per ton and, from 1 July 1984, at 2,000 lei per ton for delivery to the storage site of the processing unit.

The average production and delivery price of the crude oil from domestic production, furnished by the oilfields to the enterprise for transporting crude oil through pipelines or in their own activities of drilling and production tests, is set, beginning with the date of 1 January 1984, at 620 lei per ton, and the average production price of the crude oil from domestic production furnished by the enterprise for transporting crude oil through pipelines is set at 650 lei per ton.

The Ministry of Petroleum, with the agreement of the State Committee for Prices, the Ministry of Finance and the State Planning Committee, will set the production and delivery prices varying according to qualities and units.

Article 6. The State Planning Committee and the Ministry of Finance, on the basis of the documentation presented by the plan titulars, will make proposals regarding the introduction of the corresponding changes in the indicators provided for 1984 in the sole national plan for economic and social development and in the volume and structure of the state budget, under the conditions of maintaining the financial equilibrium.

Nicolae Ceausescu,  
Chairman  
of the Socialist Republic of Romania

Bucharest, 20 February 1984.

No 56.

#### Appendix

##### Table

Containing the Change in the Interest That Is Collected by Banks and by Other Socialist Units for the Loans Granted<sup>1</sup> and the Interest That Is Paid by Banks on the Monetary Reserves in Accounts

A. The Interest That Is Collected by Banks

(in percent, per year)

For Loans:

Item	Cur- rent <sup>2</sup>	For Re- storing Solvency	Not Paid Back on the Due Date
I. On the loans granted for the activity of production and circulation of commodities			
1. To the industrial, transportation, service, foreign-trade, supply and sales, scientific-research and design, and artisan cooperative units	10	11	12
2. To the state and cooperative commercial units, to the tourism units, to the units for collection and purchases and for utilization of agricultural products, to the production and service units of the cooperatives for production, purchases and sales of commodities and of the communal people's councils and to the agricultural mechanizations and on the loans for goods sold and services performed with payment in installments by the authorized units	8	9	10
3. To the construction-installation, drilling, geologic, and state agricultural units, to the units for the technical-material supply of agriculture, to the silvicultural units, to the institutes and experimental stations and to the economic associations between the state and cooperative units	7	9	12
4. To the cooperative agricultural units <sup>3</sup> and to the economic associations of other public organizations	7	8	9
5. To the socialist economic units, on the loans granted for:			
Stocks of rare ores, a plan reserve and wood from deadwood and windfallen trees or from fellings for forest sanitation; the coverage of the planned expenses which exceed the incomes in some quarters and which are recovered from the profits of the following quarters; and the elimination of the effects of disasters	7	-	9
Expenses for capital repairs	9	-	- <sup>4</sup>

- |   |   |   |   |
|---|---|---|---|
| 6. To the restaurant-canteens and the canteens<br>for the working people        | 4 | - | 5 |
| 7. To the banks specializing in supplementing<br>the resources for making loans | 3 | - | - |

Item	<u>For Loans:</u>		
	<u>Cur-</u>	<u>Not Paid Back</u>	
	<u>rent</u>	<u>on the Due Date</u>	

II. On the loans granted to the state and cooperative economic units for investment activity

- |  |                |                |
|--|----------------|----------------|
| 1. For supplementing their own funds for economic and social development and for: covering expenses needed for carrying out the investment projects, including putting the production capacities into operation; covering the gap planned according to quarters between the investment expenses and the formation of their own resources needed for financing them; exceeding the investment plan in accordance with the law; and supplementing the funds needed for financing housing construction, under the conditions of the law | 7 <sup>3</sup> | 8 <sup>5</sup> |
| 2. For not forming at the level of the plan their own resources meant for financing the investments  | 8              | 12             |

B. The Interest That Is Paid by Banks on the Monetary Reserves in Accounts

Item	(in percent, per year)	
	<u>Interest</u>	
1. On the monetary reserves in the current, collection <sup>6</sup> and special accounts of the state economic units <sup>6</sup> and of the cooperative organizations	5	
On the monetary reserves in the current, collection <sup>6</sup> and special accounts of the party, trade-union and public organizations and on the accounts of physical persons, except for their open accounts in the CEC <u>Savings and Loan Bank</u>	3	
On the monetary reserves resulting from their own funds, deposited by the economic units in a separate deposit account, which are held for a minimum of 1 year, the interest will be 7 percent		
In the case of noncompliance with the minimum term of 1 year, the interest will be 5 percent		

...

3. On the reserves of the Savings and Loan Bank existing in accounts at banks and other institutions	5.75
--	------

#### FOOTNOTES

1. The interest relating to the loans for the basic activity is applied to the loans granted or that are being granted on the basis of special approvals, except for the cases when a different level of interest is provided by means of laws or decrees.
2. For the extended current loans, in accordance with the law, the interest is raised by 1 percent.
3. For the loans with payment deferred on the basis of prior legal provisions, the interest provided by the respective regulatory acts will be applied, up to repayment.
4. The interest relating to the economic sector to which the socialist unit belongs is levied for the loans not paid back on the due date.
5. This interest is also applied to the loans for supplementing their own funds for economic and social development, granted after the planned date of going into operation, for the period of delay.
6. Interest is not paid on the reserves in: the collection accounts opened at the CEC and on those for the international solidarity fund and the fund for eliminating the effects of disasters; the special accounts of the foreign trade enterprises from which payments are made to third parties; and the accounts for the transfer operations of the offices of the PTT /Posts, Telegraphs and Telephones/. On the accounts of their own funds for economic and social development, interest is calculated only for the reserves that exceed the investment expenses provided in the annual plan and the income and expense budget.

12105  
CSO: 2700/161

ROMANIA

STATUS OF IMPLEMENTATION OF NEW ECONOMIC, FINANCIAL MECHANISM

Bucharest ERA SOCIALISTA in Romanian No 2, 25 Jan 84 pp 10-12

[Article by Dr Engr Barbu G. Petrescu, director general of Central Institute of Economic Research]

[Text] The tremendous theoretical and practical activity conducted after 1965 by our party, the unprecedented achievements in all spheres of the Romanian people's life, the assertion of socialist Romania's prestige on the international scene, as an active champion of friendship, cooperation and peace in the world, are inextricably tied to the invaluable input of Nicolae Ceausescu. At the head of the party and state, his creative personality has, at all levels of our social organism, impressed a style of thought and work that is dynamic, revolutionary, bold, and widely open to innovations, opposed to any dogmas and isolation, a lofty spirit of responsibility in implementation of the domestic and foreign policy.

Inextricably tied to the name of the secretary general are the uniqueness of the specific approaches adopted for the resolution of the basic problems of the organization and management of Romanian society, the creative application of scientific socialism, of the concept of dialectical and historical materialism, of the universally valid truths to conditions in Romania, the profound scrutiny of the new phenomena and aspects that emerged in the process of the revolutionary transformation of Romanian society and the contemporary world. The theses and ideas of inestimable theoretical and practical value promoted by Nicolae Ceausescu involve a significant input into the development of the theory and practice of socialist construction, into the enrichment of the revolutionary thought. The profound analysis, in light of materialist dialectics, of the stages of the revolutionary process covered by this country in building up the new social system, of the evolution of productive forces, of the current stage of the Romanian economy and its place in world economy, of the relations of ownership and distribution, and of the theoretical-ideological problems contributes to the scientific definition of the revolutionary stage in our country.

Placing rapid progress and modernization of productive forces in the center of the program for building a multilaterally developed socialist society, the party mobilized the human, material and financial resources of this country for the rapid implementation of the policy of industrialization, prioritizing the expansion of the domestic base of raw materials and the predominant growth of the key industrial branches, for the creation of a modern, intensive agriculture, the development and upgrading of socialist property in the context of greater socialist, worker, democracy, for greater economic efficiency, so that, during this decade, Romania may place among the medium economically developed countries. Compared to 1938, in 1980 the overall industrial output went up by a factor of 48, and agricultural output, by a factor of about 2.6; the per capita national income was 14 times higher. An evident proof of the dynamism of the economy is provided by the coming closer to economically developed countries in terms of production calculated per inhabitant for the chief manufactured goods, a fact which again demonstrates the correctness and efficiency of the party policy of tremendous growth of productive forces based on socialist industrialization.

The dynamic growth and modernization of the productive forces originated in and continue to be based on the option of great historical responsibility adopted by the Ninth Party Congress to appropriate a great part of the national income to accumulation. Life has demonstrated that application of a high rate of accumulation appears as an objective law for developing countries, because completing this stage involves significant increase in the economic potential to permit expansion, diversification and modernization of social production, in compliance with the needs mandated by the increase in population, the improvement of working people's well-being, the elimination of the gaps in relation to economically developed countries.

The strategy of Romania's economic development in this stage is characterized by an innovative course, concretized in the greater role of the intensive factors of extended reproduction -- as an essential requisite for the achievement of the basic goal set by the 12th Party Congress, namely the attainment of a new quality of work and life in all the areas. According to this strategy, steps are taken to modernize the economic structure, based on the development of domestic resources of raw materials and increase in the input of key industrial branches, for the enhanced role of scientific research and advanced technology, for the promotion of an advanced policy of saving raw materials and supplies, fuel and energy, for firm implementation of the system of administration based on economic and financial self-management, for greater international economic cooperation.

A consistent proponent of the growth of productive forces as a decisive factor of progress, our party firmly promotes the harmonious development of the economy, based on a modern industry and on a socialist agriculture characterized by high productivity and profitability. In the context of the rapid industrial growth, in line with the tremendous technical-scientific revolution, steps are

taken to assure the intensive development of agriculture, so that it may become a great and efficient producer of farm products to meet social needs, significantly increasing its input into creation of the national income. Actually, this is the meaning of the new agrarian revolution, as life demonstrates that the building of the socialist society is inextricably tied to and to some extent even contingent upon the existence of a highly productive and profitable agriculture, which, along with the domestic resources of raw materials, provide the base for the development of industry, for the vigorous and multilateral growth of the overall economy, the improvement of the standard of living. Therefore, in accordance with the requirements of the proportionality of economic branches and in compliance with the needs for switching to a new quality in all socio-economic areas, steps are taken for a superior harmonization of the relationships between industry and agriculture.

The comprehensive and complex process of Romania's socioeconomic development is characterized by greater socialist democracy, the objective need for building the new society which requires the perfecting of the organizational and institutional framework of social life for the purpose of effective participation of working people in running society and managing the national assets, as socialism is the conscious structure of the people, which is being built with the people and for the people.

In the context of the socioeconomic development of Romania, the party consistently works along this line, proceeding from the idea that the conscious participation of all the people in running society is contingent upon the existence of a truly democratic life, capable of promoting the enthusiasm, initiative and enterprise of people, of enhancing the discrimination of each member of the collectivity vis-a-vis his or her own activity and vis-a-vis the work of the other people, of increasing the social responsibility of all citizens. In this regard, the renewal of the economic mechanism, initiated by Nicolae Ceausescu and decided upon by the plenary session of the CC of the RCP of March 1978, involves a set of modalities which focus on tailoring the economic relations to the level of productive forces, a factor that is designed to enhance the stimulating influence and amplify the dialectical interaction of the two basic components of the mode of production, for the purpose of raising the efficiency of social production.

In the concept of our party, of its secretary general Nicolae Ceausescu, the renewal of the economic mechanism signifies a profound revolutionizing of all the system of management and organization of socioeconomic life in accordance with the requirements of the system of objective economic laws and their action, designed to meet the needs of the new stage of development which our country has entered. The new economic and financial mechanism includes all the facets of economic activity -- mode of organization and management, indicators used and means of influencing, price and material incentive systems, base of raw materials, supplies and relative consumption rates, financing of activity and reproduction, profitability and social usefulness of products, efficiency and

mobility for its increase, and so on. As a matter of fact, compared to the prior status, the new economic and financial mechanism has created the conditions for eliminating rigidity and formalism, excessive centralism, facilitating the placing of all the activity on economic principles and expansion of initiative, providing the conditions required for full utilization of the advantages of the socialist society.

The application of the new economic mechanism has opened the path to broad utilizations of the leverages of value, intertwining of centralized management with the autonomy of enterprises and administrative-territorial units in the context of implementation of the principle of democratic centralism, effective involvement of working people into management and resolution of problems posed by the administration of material and financial assets, with the emphasis on the intensive factors, for the purpose of obtaining great economic efficiency, increasing the national income. Reasserting this guideline, the December 1982 National Party Conference pointed out the truth according to which the overall activity cannot be conceived outside economic efficiency. Each enterprise must be capable of covering expenses out of its own incomes, of obtaining profits and participating in the overall development of the country.

On many occasions Nicolae Ceausescu stressed the need for firmly implementing the new economic and financial mechanism, so that all the activity may operate on the basis of economic principles, local income and expenditure budgets, so that each enterprise may be actually responsible for the manner in which it manages the assets entrusted by society and assures maximum utilization, maximum efficiency, maximum savings and, certainly, maximum increase in profits. The fact that in introducing the innovations resistance was encountered which had to be and must be put down demonstrates that solving the contradiction between new and old for assuring the more rapid rise in the efficiency of our economy does not occur automatically but involves a systematic and tenacious fight to blaze a trail for actual progress. And this involves revolutionizing the way of thinking and acting of working people, of executives, the radical change in the concept on economic development, hence with practical activity being based on profound comprehension of the objective economic laws, which give substance to the existence of the economic mechanism. Such requirements involve a major imperative because, as is known, the economic mechanism is the factor through which the influence of economic policy on the development of social production is exerted. And an effective economic policy is only the result of creative thinking, which takes into consideration the objective economic laws, that originate in the conscious, dynamic and qualitative participation of working people in management and decision-making.

On the initiative of Nicolae Ceausescu, our party is conducting an ample and intensive activity to increase the awareness of working people, to qualitatively enhance their involvement in management and decision-making, for full assertion of worker self-management. This is based on a unified institutionalized system of forms of direct participation of working people in the process of

decision-making, on the continuous broadening of the forms of cooperation between the organisms of socialist worker democracy and the state organs, with their functionality being mutually complementary and providing a more and more democratic character to our socialist society, assuring the organized participation of all social categories in running socioeconomic activity. The projects in this area are aimed at enhancing the role of the general assemblies of working people, of the councils of working people, and of the national councils, conferences and congresses, that are very important factors in the discussion of issues in the spheres involved, in the overall development of this country. In all the areas of socioeconomic activity steps are being taken to harmoniously intertwine the new organisms and forms of democratic management of society with the organs of the socialist state. As pointed out by Nicolae Ceausescu at the December 1982 National Party Conference, the paramount task of the organs of the socialist state involves assuring, in close cooperation with the organisms of worker democracy, based on rational planning, balanced development of the economy, achievement of a corresponding proportion among the various branches and sectors of activity, increase in productive forces for a rise in national wealth and improvement of the well-being of all the people.

Placing in the center of Romania's socioeconomic development the unfolding of all the activity on the principles of worker self-administration and economic and financial self-management, the set of measures to upgrade the economic and financial mechanism assures the tremendous enhancement of the initiative and direct responsibility of the collectives of working people in top-notch management of all material and energy resources, the concentration of efforts to rapidly increase profitability, upgrade the qualitative facets of economic growth, powerful mobilization of the intensive, qualitative factors of economic growth.

Our party, Nicolae Ceausescu consider worker self-administration and economic and financial self-management as a uniform principle of management and organization of enterprises. One cannot conceive self-management without self-administration; only together they synthesize democracy of direct, conscious participation of the working class, of all working people in management. That is why there were institutionalized the collective organs of management -- the general assemblies and councils of working people, and their rights and duties were expanded and codified. Moreover, the decision-making site, for all the issues that involve the activity and responsibility of economic units, was shifted down, to the level of the enterprise, working people, in point of fact, being the owners of the enterprise and having direct responsibility for preserving and protecting the property entrusted to them.

To create the closest possible tie of each working person with the enterprise in which he or she works, Law No 3/1982 worked out on the basis of the measures outlined at the National Party Conference stated the working people's right to provide a contribution in cash, in the form of social shares, to the creation of the fund for economic development of the enterprise in which they are employed and to obtain a supplemental income from the enterprise's profit in light of this input.

By participation with social shares in creation of the fund for economic development working people more directly and more efficiently fulfill their capacity as owners over the part of the property of all the people that was entrusted to them for administration and expansion. This generates increased interest of all working people for rational management of the enterprise's funds, for the quality of organization and direction of the entire activity, for substantiation of decision-making, and, moreover, enhances the responsibility of each collective, of each worker, engineer, economist, and others for the manner in which the national assets are used. Furthermore, direct participation is meant to consolidate the autonomy of economic units, to transform the powers given them under the law from powers still under some aspects potential into actual powers, thus conditions being created for elimination of bureaucratic tutelage of these units by hierarchically superior organisms, for genuine cooperation between decision-making levels and factors.

Improvement of planning, in the context of closer and closer cooperation between state organs and the new democratic organisms for management of enterprises, is mirrored in the fact that a number of powers in the area of planning are transferred to the last-named, thus achieving a dovetailing of unified direction, based on the uniform national plan, of the economy with the autonomy of economic units, with worker self-administration and economic and financial self-management.

Defining the increase in economic efficiency as a basic requirement of the new mechanism, the secretary general of our party dwells on a set of factors which he considers as essential at this stage. In the first place, improvement of labor productivity by mechanization and automation of production processes, upgrading of the vocational and technical training of workers, technicians and engineers, of all working people. In the second place, reduction of materials consumption rates and achievement of savings in all the areas of activity. Because per unit of product our consumption rates are far higher than those that exist internationally for similar products, it is estimated that if material and financial assets are well managed we can obtain an at least 15-20% rise in production. In the third place, an essential factor involves the increase in the degree of utilization of natural resources for obtaining, from the identical quantity of raw materials, products characterized by a higher level of processing and better quality. Important are the improvement in the use of fixed assets, of production capacity, acceleration of the speed of circulation of enterprise funds and the rise in the efficiency of foreign trade.

The programs adopted last December, which were formulated under the direct guidance of Nicolae Ceausescu, for the greater increase in labor productivity, improvement in the technical and qualitative standards of products, reduced use of raw materials and energy and better utilization of raw materials are aimed at helping, by their exemplary implementation, to significantly increase economic efficiency, with the measures incorporated assuring the superior use of our tremendous economic potential and thereby the rapid rise in the national income.

For proper operation of the entire economic and social mechanism, very important was the price setting system. In this area, the main deficiency involves the fact that a number of prices were set without taking into consideration the social production costs, disregarding the criteria of the law of value. As assessed by Nicolae Ceausescu, only in the context of correctly set prices the enterprises can take steps to cut costs, to increase profitability and eliminate losses for some products. The measures taken for improvement and updating of prices focused on including actual costs in prices and this has assured the taking into consideration of the law of value. By resetting of prices and better correlation in each case coupled with taking into consideration of social costs and with the value of utilization of products actual conditions were created for increasing the profitability of branches, enterprises and each product. As a result of this drive, profits reached normal levels, permitting the creation of the enterprise's own funds, enabling the economic units to assure self-financing and reduce costs.

In this context, the old financial plans were replaced with the own budget of incomes and expenditures. It is not a matter of formal change but of a qualitative change. Under the new conditions, the economic units must ensure their budget balance by their own resources, they must obtain financial results required for the creation of their own funds and an input into the overall development of society. Without a continuous increase in efficiency, in the profitability of each activity, there can be no implementation of the new economic mechanism.

The rise in economic efficiency has mandated the upgrading of the system of indicators, the promotion of net production, of profits to the foreground. But these indicators have a value character and are designed to help reduce materials expenditure, increase in profitability, and on the overall social scale, the rise in the national income. But the value amounts must be covered by physical production, and the achievement of profits, like of other parts of plus-product, can occur only on the basis of the sold and paid-for marketable output. With good reason the party secretary general indicated that, in addition to the net production, the problem of the sold and paid-for marketable output and of physical production must be placed at the same level, because without achieving the marketable output and selling it, without achieving the physical production one cannot implement the new economic mechanism.

The personal material incentive system formulated on the basis of the decisions of the December 1982 National Party Conference is an integral part of the new economic mechanism. Remuneration and participation in the distribution of incomes are the primary tools of combining the individual interests of working people with the collective and overall interests. Under the former system it was possible to obtain personal incomes, within certain limits, regardless of the overall results of the economic units. But in the context of the new economic and financial mechanism, personal incomes are directly tied to the incomes of the units of employment. Under the new rates of remuneration,

nobody can any longer have a guaranteed income if he or she does not work correspondingly to the incomes that he or she wishes to cash in. The proportionality planned to be obtained between the level of remuneration and the degree of implementation of the plan, the improvement in the system of participation in profits and granting of bonuses, the rise in the volume of bonuses in total incomes and granting of bonuses in light of each person's work lend greater firmness to the principle according to the work put in. Under the measures taken in the area of remuneration, specifically by extension of the overall contract system, impetus is given to the more rapid rise in labor productivity, obtained not only by action focused on the numerator of the productivity ratio but also on its denominator.

The economic mechanism cannot be regarded as a finite element, which cannot be upgraded. To the contrary, this process is perfectly natural if one takes into account the fact that, on the one hand, there is a continuous change in domestic and international conditions, and on the other hand, that the very elements of the new economic mechanism did not occur all at the same time, but were transposed in legal form successively, at various periods, and this, all the more, involves successive adaptations to new situations, taking of measures to do away with noncorrelations and discrepancies noted. That is why the upgrading process, as an objective process, needs to proceed incessantly, with science playing a primordial role in this area, being the factor that must substantiate approaches for decision-making agencies, for practical activity, pertaining to perfection of worker self-administration and economic and financial self-management, improvement of the material incentive system, upgrading of the planning methodology and the system of indicators.

The measures to upgrade the mechanism of operation of the economy place all the management and planning activity in this country on scientific criteria, a fact that is capable of decisively potentiating and fructifying the creative efforts of our people. The source of this certitude resides in the fact that the revolutionary work of building a multilaterally developed socialist society is headed by the party of the working class, the Romanian Communist Party, the leading political force of the country, which during the construction of socialism in this country has brilliantly demonstrated its capacity of scientific forecast, of organization and mobilization of the creative energies of the people, of all the resources, in achieving the goals set.

The upgrading of the forms of organization and management of our entire society will contribute to the overall progress of the economy, as a result of the dedicated efforts of all the people, that, under the leadership of the Romanian Communist Party, its secretary general Nicolae Ceausescu, firmly implement the domestic and foreign policy of the party, of all our socialist nation.

Dwelling on Romania's tremendous socioeconomic development under socialist construction and on future prospects, Nicolae Ceausescu, in his report to the 12th Congress, pointed out: "This will signify that, during a period of about

half a century since the revolution of social and national liberation, there will be a huge leap in Romania's history, in the destiny of our people, actually bearing out the superiority of the new social system, which assures the full utilization of the national wealths to the benefit of the entire society, the creation of a free and happy life for all working people, the attainment of the loftiest ideals of social justice and equity of all our people."

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ROMANIA

ROLE OF SCIENCE, TECHNOLOGY IN ASSURING ENERGY INDEPENDENCE

Bucharest ERA SOCIALISTA in Romanian No 2, 25 Jan 84 pp 42-45

[Article by Mircea Mares]

[Text] The evolution of economic and political life all over the world bears out, by the indisputable strength of facts, the importance for the country's present and future of the strategy outlined by the 12th Party Congress with respect to meeting the energy needs predominantly from domestic resources and achieving, within several years, the energy independence of Romania. The achievement of energy independence -- planned as a priority objective under this five-year plan based on the concept and initiative of party secretary general Nicolae Ceausescu -- raises to higher qualitative levels the constant concerns of the Romanian Communist Party for assuring energy as a premise of socioeconomic development.

In accordance with the guidelines outlined by the party and state leadership, scientific research and design in the area of energy are deeply involved in implementing the overall energy strategy and also each of its components -- energy saving, greater and more rapid utilization of low-grade fuels, of the hydro-energetic potential and new and recoverable energy sources, expansion of thermal energy production, a more rapid rate in completion of nuclear power plants and replacement of hydrocarbons in power production uses.

It is a fact that socioeconomic life is still unfolding in light and on the basis of the generation of technologies created in the context of inexpensive and apparently unlimitedly available energy, technologies built on the structure of use of energy, with numerous energy consuming processes, such as combustion, melting, distillation, chemical reactions that occur at high temperatures and pressures, electrolysis, and the like. The pressing issue is for all these types of processes to be replaced by other processes that would achieve the same useful purposes, but using far less energy. That is why research in the areas of catalysis, biotechnologies, photosynthesis, use of radiations, composite materials, and so on -- areas in which results were obtained which justify further efforts and optimism -- are very topical concerns of science for the purpose of creating new generations of processes and technologies.

But even with respect to the processes and facilities specific to current technologies, many of them have been conceived and structured with low energy efficiency, a fact that results in exaggerated and irrational energy use. Therefore, the determination and promotion of the avenues to increasing energy efficiency in processes for utilization of energy, beginning with restructuring and rationalization of technological procedures themselves, involve a priority field of action -- equally and collectively -- of technologies in various areas and of energy experts.

Moreover, the goal of saving energy, by all means, in consumption processes is of greatest importance in the context of the need for utilization of raw materials that are poorer in useful substances, and raw materials are obtained under more difficult geological conditions; furthermore, in the context in which it is necessary to turn out products of better quality, to protect the environment, to assure the continuous upgrading of the quality of life and work -- by extra technical progress, in order to limit or compensate the rises in energy use generated by such trends and objective needs.

Regarding this priority of priorities involved in energy saving based on science and technical advances, noteworthy is the fact that the new generation of technologies is not created in a vacuum. The last decades have seen the building in this country of a powerful industry, the completion of large production facilities, and now there is the need for the formulation of the technical approaches to their further modernization, while moving ahead, by using new technologies that permit greater and greater energy saving by adaptations or minimum restructuring of existing installations. At the plenary session of the National Council for Science and Technology in June 1983, academician Dr. Engr. Elena Ceausescu pointed out: "Our country has planned to achieve, in the next years, the strategical objective of energy independence and by the end of the decade -- to assure the largest part of the necessary amount of raw materials from domestic production. To this end, under the priority programs worked out on the basis of the decisions of the National Conference, we place special emphasis on the tremendous development of the base of energy and raw materials and, at the same time, we firmly focus on reducing the use of materials and energy and production costs, decrease imports and increase exports.... The major concern of specialized institutes in the sectors of raw materials and energy must involve the formulation of new technologies, design and production of new machines and installations that are needed for the diversification of resources, increase in the production of mineral raw materials and energy and energy use based on maximum economic efficiency."

The activity of research and development and integration of technical advances which unfolds at the Central Institute for Energy Research [CIER] and its main component units -- the Institute for Energy Research and Modernization [IERM] and the Hydroelectric Power Studies and Design Institute [HPSDI] -- is inextricably tied to the problems and efforts of the energy sector to boost the production of electric and thermal energy on the basis of low-grade fuels, to

increase the availabilities of facilities in electric power stations, to reduce relative and characteristic consumption rates, to utilize new energy sources, to formulate new technologies and arrangements for the production of items to do away with import. A notable research potential is involved in the activity of upgrading the technologies of operation of electric power stations, for the purpose of increasing the output of electric energy based on coal and of reducing the use of hydrocarbons. In this area, worthy of note are the modernization of aggregate units for the 330 MW sets, the rise in the capacity of coal facilities and of lignite supply circuits of boilers, the extra assembly of separators for retention of metal bodies in coal, formulation of technologies for enrichment of lignites and shale, and so on.

The intensive use of the hydroelectric power potential (development of the Danube potential and of the potential of inland rivers) also is a constant concern of the Central Institute for Energy Research. The surveys of study and design, of research and integration of technical advances, and the new computer methods worked out in the CIER units have resulted in provision in projects of new and upgraded structural approaches and technologies, with applications at the Iron Gate II Hydroelectric Power Stations on the Danube, at the hydroelectric power stations on the rivers Olt upstream of Slatina, Riul Mare-Retezat and a number of microhydroelectric power stations.

Research for reduction of import and arrangement for the production of certain items involves one of the basic activities of energy research units. It has made it possible to turn out with domestic resources a significant volume of unique products, installations and spare parts for the purpose of cutting imports in the enterprises under the Ministry of Electric Power and for the power producing facilities of other ministries. In 1983 the value of production and microproduction within the framework of CIER amounted to about 200 million lei.

As for new and recoverable energy sources, a number of first results have been obtained; research will be continued for achieving high-capacity components and installations for solar stations, heat pumps and eolian units.

Although many and important achievements have been obtained -- as assessed in the collective leadership body of the Central Institute of Energy Research -- in the activity of some component units of CIER there is the need for taking some steps to improve the activity. For instance, the area of thermal energy and the area of new and recoverable energy sources should be strengthened; approaches specifically involve very pressing objectives, without constant attention paid to overall problems and over longer periods. Moreover, it is considered that the role of research, including the one in machine building -- as a determining factor for upgrading design and production of equipment required by the national power producing system -- did not comply with requirements in terms of proper operation of thermomechanical installations. Furthermore, the input of energy research into rationalization of energy and fuel using processes still is inadequate in light of the major tasks set in this area and the needs of the various industrial units.

Proceeding from the results obtained by research and design in light of current problems of rapid development of our power industry, and of conservation and better utilization of energy resources, one can clearly see the major role assigned to CIER in the area of coordinating the activity of its component units and the promotion and monitoring of all the activity of research and development and integration of technical advances. In this context, the subject-matter of research, engineering and design incorporated in the 1984-1985 plan of CIER is structured to best possibly meet the requirements of the current stage in accordance with the provisions of the "program for improvement of the technical and qualitative standards of products, reduced use of raw materials, fuel and energy and better utilization of raw materials and supplies during the 1983-1985 period and by 1990," approved by the plenary session of the CC of the RCP held in November 1983.

The concept that underlay the completion, in the last decade, of thermoelectric power plants in Romania involved priority use of domestic low-grade fuels (lignite, mostly, and shale), and also utilization of top-efficient technologies for the production of electric energy and heat. There were completed power plants with large condensation sets -- 330 MW -- with currently top technological performances, located at lignite pit mouths: Rovinari and Turceni thermoelectric power stations. Furthermore, nearby major towns and industries, steam power plants developed; the combined production of electric energy and heat today represents the production technology with the highest efficiency. For the completion of these plants an arrangement was made for building the required facilities -- 330 MW condensation units operating on the basis of lignite and shale, thermal energy units of various types (DSL-50 MW, FIL-150 MW and others).

For the purpose of stepping up the utilization of low-grade fuels in electric power stations and increasing the efficiency of these units, steps are being taken to apply, on an overall scale, for all 330 MW sets in the Rovinari and Turceni stations, the measures for their modernization. Specifically, action will be taken to increase safety in operation of these stations. Moreover, by the end of 1985 it is planned to finalize the adaptation and modernization of machines and installations at the Deva thermoelectric power plant for its operation at its rated capacity, with low-grade fuel from dressing coal from Jiu Valley.

Research and design face a whole set of projects to reduce relative consumption rates for fuels and local energy and heat use in enterprises of the power sector (production of facilities for determination in flow, at the station, of the power-producing features of coals, deeper scrutiny of operation technologies in thermoelectric power stations and conditions of operation for the various types of installations to eliminate departures from the relative consumption rates; expansion of the research front for achievement of energy recovery from the hot water eliminated, by using high-capacity heat pumps integrated in the zonal systems for heat supply, and from combustion gases, by means of electric energy generating installations, and so forth).

The Nuclear Power Plant at Cernavoda is the paramount power-producing facility, whose construction is in full swing. The power of this plant, 5x660 MW final range, will mark a major input into this country's power balance. The plant is expected to go into operation, on a phased-out basis, beginning in 1986. This plant involves the first nuclear project from a comprehensive program which envisions the further construction of other nuclear power plants.

Worthy of note is the fact that for this first nuclear project of this country arrangements were made for the production of a large number of components by our industry. In light of the significance in terms of power production, the technical novelty and the short construction cycles scheduled for this facility, the ablest experts, including those in CIER units, are now involved in resolving all the complex problems, under special research programs, which were worked out and are in the process of development under the direct guidance of academician doctor engineer Elena Ceausescu, chairman of the National Council for Science and Technology.

Another major power-producing unit under construction, for which, also, design and building-assembly operations are unfolding simultaneously, involves the Anina Thermoelectric Power Station based on shale (final range 3x330 MW). This power station is designed to make use of the shale in Banat. Its completion is part of a broader program for rational and complex utilization of shale, a program that involves shale quarrying, burning of shale at the Anina station, extraction of alumina and iron from schist ash, extraction and production of schist oil, production of cement and of construction materials.

The construction, for the first time in this country, of a thermoelectric power station based on shale has posed and continues to pose a number of problems of research and design relating to the building of the equipment and specific of location, problems whose solution cause this station to be an absolute first nationally. Moreover, in light of the characteristics of shale, the station can be considered as a unique project internationally. During the construction of the Anina thermoelectric power station, a set of improvements were applied to equipment and functional diagrams, improvements that also resulted from experience in operation of the Rovinari and Turceni thermoelectric power stations, in the context of actually updated activity of modernization of the equipment in order to best possibly cope with the complex requirements in terms of operation. The first 330 MW set of this thermoelectric power station will go into operation; currently, an ample program is in progress for running in, checking and trial to assure success in the new test of the Romanian power industry.

Thermal energy production, i.e. combined production of electric energy and heat, is a highly energy efficient approach in meeting the needs for electric energy and heat. In the next stage, the power plants to be built in this country will be only steam power plants. By the end of 1983, the installed power in the steam power plants of the national energy system totalled about 4300 MW, which accounts for one-third of the power of all thermoelectric power plants and an

output of heat of 80 million Gcal was obtained. The fuel savings achieved as a result of thermal energy production amounted in 1983 to about 2.8 million tons of conventional fuel.

A number of steam power plants are now in an advanced stage of construction: at Suceava, Iasi, Bucharest-Progresul, Giurgiu, Arad, Timisoara, Oradea, Drobeta-Turnu-Severin, Craiova II, and so on. Construction sites for other steam power plants will open in Brasov, Bacau, Tg. Jiu, Slatina, and so forth. Concurrently with completing these new steam power plants it is planned to switch the operation of some existing plants that use hydrocarbons to operation based on coal. To this end, work has commenced at the Govora and Pitesti power plants and surveys are in progress to switch to coal other power plants (Bucharest-West, Palas, and so on). As a result of the completion of new steam power plants and the switch to coal in existing power plants, by the end of the next five-year plan a total quantity of hydrocarbons of about 6 million tons of conventional fuel will be made available.

The Central Institute for Energy Research has provided, in addition to the overall concept of power plants, also detail approaches to reducing the use of fuel and electric energy, following a few major lines: reducing additive hydrocarbons for coal burning (use of postburning grates for boilers with lignite based operation, thus improving their efficiency; changes in coal dressing and burning installations to upgrade burning conditions and increase the efficiency of boilers; design and execution by the Institute for Power Research and Modernization of fuel oil mini-injectors and gas miniburners which, when fitted into the Rovinari and Turceni boilers, resulted in the about 10-15% reduction in fuel oil additive); increasing the level of thermal power production (achievement of thermal power production turbines and conversion of some existing condensation turbines into thermal power production turbines -- at Deva, Doicesti, and so on; reducing technological heat losses in condensers of thermal power production turbines, and so forth); upgrading technologies of power plant operation for their cost-effective run (design and production of installations to upgrade vacuum in condensation steam turbines; improving of yields in operation of steam boilers by preparing running cards; development and application of advanced methods for dynamic control of cost-effective operation of thermoelectric power plants, and so forth); reducing local technological use of electric energy in thermoelectric power plants and in the thermal power production system (structural changes in air and gas fans of steam boilers to increase their efficiency; upgrading the operation of major supply pumps in 330 MW units; introducing combined quantitative-qualitative control in urban thermal power production networks).

The 1983 state plan envisioned 11 itemized projects for activities of research and development and integration of technical advances in the areas of new and reusable energy sources, activities conducted by the Institute for Power Research and Modernization, the Institute for Power Studies and Design and the Hydroelectric Power Studies and Design Institute. In the area of new and

reusable energy sources, in accordance with the programs outlined nationally and with the objectives envisioned in the state plan, the efforts of the Central Institute for Energy Research are focused on three main factors: research, development and integration of technical advances; expanded application in production of the approaches to making good use of new and reusable energy sources within the framework of units under the Ministry of Electric Power; coordination and guided application in all economic branches of heat pumps and geothermal energy -- activities that derive from the capacity of the Ministry of Electric Power as sole administrator of energy sources.

Intensive use of urban and industrial thermal power production also involves a very advantageous procedure of recovering heat eliminated at the cold source in installations of thermoelectric power plants. The energy recovered in the form of heat produced in thermal power production, for obtaining hot water and industrial steam, now accounts for about 4.8 t c f a year. Moreover, realization of energy steam boilers with solutions to maximal use of the heat of combustion gases for preheating air and feed water permits cutting draft off-heat to minimal limits economically. For the purpose of even better utilization of reusable energy resources, objectives are incorporated in research and investment plans which focus on using -- with heat pumps or directly -- low temperature heat sources, principally the cooling water in thermoelectric power plants.

In CIER units approaches were developed which are under way of being applied (installations with heat pumps having unit powers of 0.03, 0.1, 0.2, 0.3 and 0.6 Gcal/hour). They help to utilize the hot water eliminated, for the purpose of local heat supply and for remote heat supply through hot water networks (installations with heat pumps having unit powers between 6.3 and 25 Gcal/hour that use cooling waters from major industrial combines). In light of the current stage and the programs for arrangements for the production of water pumps and in line with the results of studies developed by the Institute for Power Research and Modernization and the Institute for Power Studies and Design, during the 1982-1983 period the focus was on applications in the first category, and beginning in 1984 it is anticipated to install a growing number of high-capacity heat pumps.

For the utilization of the heat from cooling waters from power plants there was created an experimental hothouse of 1500 sq m heated with water obtained from the cooling circuit of Bucharest-West Thermoelectric Power Plant. In light of the good results obtained, steps were taken to build a hothouse of 0.5 ha heated with water from the cooling circuit of Bucharest-South Thermoelectric Power Plant. Plans provide for the construction, by the Ministry of Agriculture and the Food Industry, of an experimental unit of 0.5 ha in the area of the Isalnita Thermoelectric Power Plant for the study of soil heating methods in hothouses by using water from the plant's cooling circuit as thermal agent. The conclusions of these experiments will underlie the optimal approach to using the low potential heat of cooling waters to heat the hothouse that will be built in the future in Turceni.

In accordance with the research and development programs in the area of renewable energies, the plan of the Institute for Power Research and Modernization provides for research in the field of thermodynamic conversion of solar energy. Prior years saw the construction of an experimental low temperature solar micropower plant. For thermodynamic conversion of solar energy at high temperatures research is being conducted to develop the energy concept on an overall level and also of the specific component units for solar power plants. Under completion are experimental models of heliostat and parabolic high capacity solar concentrators with automatic tracking of the sun. The testing of these systems is coupled with preparation of the technical-economic study for completion of a 1000 kWe experimental solar power plant.

As for research and development in the area of utilization of eolian energy, studies and tests are being conducted to develop rapid horizontal axle air generators to be located in the mountain zone, a zone that accounts for about 65-70% of the total eolian potential. The first stage of research conducted by the Institute for Power Research and Modernization involved production and testing of a 20 kW experimental air generator, installed in the Petrimanu-Lotru mountain zone. It is planned that the next stage will involve completion of higher power air generators (100 kW and 300 kW). Moreover, special attention will be paid to prospects for locating in the Danube Delta eolian units for capitalization on the important existing potential in that area. On the basis of the two stages of research and development it will be possible to move, under the next five-year plan, to completing eolian installations with powers of 1 MW and greater, characterized by a high level of automation -- which will be supplied to the future eolian power plants.

In the area of using geothermal energy, the Institute for Power Research and Modernization will focus on resolving technological problems relating to energy processes in specific installations which will be turned out (use of heat pumps for utilization of geothermal waste waters or with reduced reservoir temperatures; prevention of corrosion and deposits in installations; development of standard designs for installations to utilize geothermal waters at Felix-Bihor, Boghis-Salaj). Furthermore, in progress are studies to determine the technical-economic approaches to utilizing geothermal waters obtained from wells under the Ministry of Geology, in the areas of Bucharest and Braila municipalities.

Implementation of the energy program outlined by the party leadership is assured by appropriation of a large amount of investment funds, specifically for construction of steam power plants and coal-based thermoelectric power plants, hydroelectric power plants, nuclear power plants; and for the corresponding expansion of electric and thermal power production networks. Research and design needed for the production of the new installations based on the most up-to-date and top energy efficient approaches will also focus on ensuring high efficiency of investments, great labor productivity and environmental protection. All this entails requirements that involve a high sense of responsibility in the activity of energy researchers and designers in relation to the needs for completing the national energy program, for assuring, in the shortest possible time, Romania's energy independence.

11710

CSO: 2700/158

ROMANIA

REGULATION ON SHARING OF EXPENSES IN APARTMENT BUILDINGS

Bucharest ROMANIA LIBERA in Romanian 22 Feb 84 p 2

[Article by Marius Georgescu: "New Regulations on Joint Sharing of Expenses in Large Apartment Complexes"]

[Text] Recently new regulations were adopted concerning the apportioning of common expenses in apartment complexes among those who hold housing or other spaces, either physical or juridical persons. The regulations were published in the BULETINUL OFICIAL Part 1, No 7 of 28 January 1984. We contacted engineer Corneliu Steiniceanu, a deputy director in the Committee for the Problems of People's Councils, to obtain some details on the new regulations.

[Question] The regulations to which you refer are contained in the Decision of the Executive Bureau of the Committee for the Problems of People's Councils. They are based on Law No 10/1973 and Article 27 of the Council of Ministers Decision 860/1973. A modification and expansion of the old regulations were necessary as a result of the changes introduced in later normative acts (Decree No 387/1977 and the Communal Administration Law No 4/1981) and because of the recommendations of citizens and tenant groups. They also stemmed from experiences gained over the past 10 years since the rules went into effect. For the most part, they have followed the same general lines of earlier criteria, but where it was necessary, new rules were introduced concerning the apportioning of expenses which were still in keeping with the general well-known framework.

Could you refer specifically to the new elements and at the same time point out the new guidelines?

[Answer] As you know, the regulations refer to each category of attendant expenses separately, for example: maintenance and repair, water and sewage, electric consumption, trash and refuse collection, water heating, gas consumption and so on. I will try to touch on a few of these but I will not claim to cover them all. First, let us look at maintenance and repair. In principle, the laws maintain the criterion of sharing expenses proportionally among the number of people who use the common areas and facilities, with the stipulation that this applies only where tenants are legally bound to pay these costs. As an exception to this rule,

expenses incurred in refinishing wall coverings, pictures and paintings on walls and ceilings (where they exist), painting on woodwork, cleaning gutters and pipes including those of terraces, and lighting fixtures will be divided proportionally based on private living area occupied. Additionally, in accordance with regulations in effect concerning the organization and operation of tenant associations, rules were introduced whereby the cost of maintenance and repair in common areas and facilities that are established as the legal responsibility of the landlords, regardless of whether they live in their apartments, will be apportioned with the landlord responsible for the individual share for the common areas and facilities.

[Question] What are the regulations for costs related to central heating?

[Answer] The chapter of the law relating to central heating was supplemented and formulated more clearly in that the living area defined by law (Article 2, Paragraph 2 of Law No 5/1973) is used in calculating the apportionment of expenses whether or not that area has its own heating system. However, the area in exterior rooms (vestibules, anterooms, corridors, kitchens, kitchenettes, office, pantry, lumbressed, bath, etc.) is included only in the event that during or after construction these rooms were equipped with their own heating systems in accordance with regulations and in conformance with technical design norms. In this same chapter there are also rules allowing the elimination or reduction of the area heated in garages, provided that this does not alter the thermal equilibrium of the buildings where they are located. Furthermore, there is also the stipulation that where a number of buildings are connected to thermal stations or central units and these buildings are not equipped with thermal energy meters, the heating costs will be divided among the buildings in relation to their equivalent thermal area determined by the regulations under which these buildings were equipped in accordance with technical design norms.

[Quesiton] So a new concept has been introduced: equivalent thermal area?

[Answer] Yes, to better understand the need to modify the criteria for apportioning heating costs, namely replacing "the area to be heated" with "the equivalent thermal area" as the basis for calculation, I should point out first of all that the heat given off by a square meter of steel radiator does not equal that given off by a square meter of iron radiator. It is 20 to 30 percent less. Thus, for the same heating requirement in a room you would have to use a correspondingly larger steel radiator than an iron radiator. Given that recently in the newer buildings they have begun to install steel radiators (the Roterm radiators and the panel-type convector-radiator) along with the iron radiators, the old system of calculating the apportioning of heating costs based on radiator surface area became invalid as it unfairly penalized the tenants and owners of buildings equipped with steel radiators. So to establish a new correct equivalent for the different types of iron and steel radiators in the state norms, they introduced a new unit of reference for radiators which indicates the size of various types of radiators in these new units and the square meter heating surface area for all types of radiators that we produce in the country.

[Question] What other new provisions do you think we should bring to the attention of our readers?

[Answer] I will touch on the more important ones. In the context of new regulations, I would mention the exemption from sharing costs for the electricity used to operate elevators for tenants who live in basement or semi-basement apartments, ground floor, mezzanine or first floor (where there is no mezzanine) apartments when a common bath and laundry are not located on the upper floors. When they are, these tenants will be charged at the rate for half the number of occupants that live in the apartments. Another regulation of note covers costs for filling fire extinguishers, and for rat and insect control where costs are apportioned based on the private living space occupied by each tenant. Another provision exempts persons who are temporarily away from the building for one or more calendar months at a time except for expenses stipulated in earlier laws and for costs related to electricity consumption for lighting common areas, hot water heaters, water pressure distribution systems, elevators and gas consumption that is divided according to the number of people. The expenses for work for which the tenants are legally obligated are also apportioned according to these regulations when the landlords live in their own apartments.

[Question] In closing, would you please tell us about the duties--in the context of the subjects we have been discussing--which the committees and executive bureaus of the people's councils have, as well as those which the tenant organizations and private citizens have?

[Answer] The committees and executive bureaus of the people's council, according to the law, have the authority to guide, assist and supervise the tenant associations in everything that they do. The primary concerns of the local organizations must be to assist with the obligation of every tenant organization and citizen to fully understand and correctly apply these regulations. Going farther, they should resolutely work together so that all housing tenants totally fulfill the obligations they have under the current regulations to maintain and repair their buildings, to assure the upkeep of common use areas and facilities in each building and to strictly conserve thermal and electrical energy, fuel and water--in other words, to keep the common expenses at an absolute minimum.

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CSO: 2700/154

YUGOSLAVIA

LCY WEEKLY DISCUSSES INCREASE IN ECONOMIC CRIME

Belgrade KOMUNIST in Serbo-Croatian 24 Feb 84 p 9

Article by Djuro Djuraskovic: "Crime Gains New Ground; the Erosion of Social Property"

Text The increase in different forms of crime, especially economic crime, is a matter of the greatest concern for the working man, who earns his income with honest and conscientious work in publicly-owned production facilities. The public is being increasingly bombarded with reports of profitable acts of misappropriation, large embezzlements, both large- and small-scale theft, highly imaginative operations which appropriate publicly-owned property, relatively mild punishments, and with obvious but ineffective statements characterizing these occurrences as immoral while recommending that we must do everything possible to put an end to this lawlessness. Leaders of social political communities and organizations condemn these occurrences uniformly and decisively, but, in spite of achieving some results, including an increasing number of disclosures of different forms of theft, they do not do enough. That is what bothers the average citizen the most. Are we indeed powerless before assaults on social property, on the material base of the entire self-management organization of our society?

Profitable Acts of Misappropriation

The first obstacle to preserving the integrity of social property exists in the minds of the majority of the people of our country. In almost all conflicts between public and private interests the latter wins out. And the overall distribution of national income favoring the nonproductive segments of society, in which the power of the bureaucracy and the inclination to protect acquired privileges are dominant, is characterized by appropriation outside of productive labor, which also is a certain kind of assault on social property.

Confronted by an objective situation in which an excessive amount of his income is being appropriated, the worker is prepared to support action which improves his material position, even temporarily, without always taking into account social property, socialist solidarity, participation in the distribution of income according to work, and subsequently, the essential principles of socialist relations. Today it is not difficult to persuade working people to accept an increase in their own incomes which is to the detriment of

material development, thus giving immediate interests priority over long-term interests.

Is not an increase in prices which is not justified economically also a form of redistribution of income outside of productive work, that is, taking what belongs to someone else? And making this kind of a decision is relatively easy in self-management organs and other decisionmaking institutions.

Some social-political communities stubbornly insist on noneconomic investments, introducing disorder into the unified Yugoslav market, which sees in this a certain partial, even profitable, interest covered up by loud socialistic phrases concerning self-management rights. When ~~text illegible~~ these actions create an economic cripple, it is left to be a burden on society, and those responsible for the actions move on in time to a better, more secure, more profitable position for them. Recently there has been an increasing number of reports on failed organizations of associated labor whose leaders in the meantime have taken on similar, or even better, and more responsible jobs.

At first glance, it may appear that self-management is to blame for these occurrences, because all similar activities are formally and legally "covered up" by decisions made by self-management organs. Foes of self-management use this explanation quite often. Behind similar decisions, however, there are most often actually technical and managerial teams of labor organizations which have become bureaucratic and which are firmly connected with similar teams in banks, social-political communities, etc., which are incapable of confronting the problems and difficulties for economic and profitable production and which resort to profitable acts of misappropriation, demonstrating these schemes to the workers as the only decision possible, and one which is immediately very profitable. A group ownership consciousness has developed on this basis, so extensive and reinforced that it strikes the basis of social ownership in an elemental way; it eats into its essence and opens the doors not only to autarchy, but also to the classic forms of economic crime. Moreover, it should be stated clearly that these acts of misappropriation do not originate in the nature of self-management and its material basis--social ownership--but in its bureaucratic distortions and in the corresponding comprehension of social ownership as group ownership or state ownership. Indeed, sometimes it is hard to draw the line between acts which defend income from the preemptive nature of the bureaucratic and administrative apparatus, and those which violate the law for the sake of private or group profit.

#### Economic Crime on the Rise

The number of criminal cases in the area of classic economic crime has increased in recent years in spite of all the major efforts to put an end to these occurrences. Let us say that during the first 6 months of last year almost the same number of these violations were noted as for all of 1981. By some accounts, this increase can be explained by the greater efficiency of the prosecutor's office, but even taking this factor into consideration, the increase is still quite large. The total material cost can already be measured in the billions of dinars.

Economic crime is most often "stuck" on managerial people. In our system of control and authority it is difficult to imagine that anyone could appropriate

social property without the knowledge or participation of management. The forms of this appropriation are so developed and so imaginatively perfected by now that it is very difficult to track them down. It is also difficult because of the fact that it is usually necessary to find a great number of people who are involved in the scheme, people who are sometimes quite powerful in their surroundings. Nevertheless, the numbers indicate that prosecution offices are becoming increasingly successful at catching them.

In 1982, 22,528 criminal cases were filed. The greatest number of them--4,093--involved abuse of official position. Next came embezzlement with 3,010 cases, then cases involving falsified official documents with 2,952, then prohibited trade activities with 2,904, theft with 1,567, unscrupulous business dealings with 1,396, etc. The numbers were somewhat larger for 1983. Especially interesting was the fact that 1 out of every 8 violators--a total of 3,077--was a repeat offender, or had been earlier convicted and then again placed in a position of responsibility for managing social property.

Most of the crime took place in areas involving turnover, then in industry, transportation, and in financial, technical, and business organs. In a large number of trade shops, a system of appropriating part of "earned" money has been worked out. In certain stores this is the "privilege" of the manager, and in others the rest share the "dessert." Recently one could hear a story in Belgrade about the manager of a large trade enterprise, who when left without money, would criticize a certain store, and the next day a blue envelope would be waiting for him on the table. This would end the criticism. The story is, perhaps, a fabrication, but it reflects the basic conviction, and a partially confirmed practice that if some money is made by abusing a regulation concerning the handling of goods, it is not exactly considered to be some sort of violation by those in commerce. Violations which are uncovered in this area are virtually insignificant compared to what is actually going on.

In its importance, value, and in the danger of undermining the economic foundation of society, misappropriation in the area of foreign trade merits special attention. Especially when done on a large scale, it leads to an outflow of a portion of national wealth abroad, and it weakens the liquidity of the country; some speculative activities stimulate inflation, disturb the unified Yugoslav market, etc. The world markets, with their extensive system of mediation and commission activities entice many greedy people to realize what are frequently large profits for the benefit of their labor organization. There are unscrupulous individuals who are in a position to sign contracts involving much higher prices than are current on the world market, solely for the sake of retaining a portion of that difference for themselves, through the inclusion of unnecessary intermediaries, or by some other means. Unfortunately, it is often the case that an entire labor organization is involved in speculation, and by using a false statement of an import order, "earns" several billion old dinars in each case. The struggle against such occurrences is made all the more difficult because authorized organs in the republics and provinces evaluate the essence and the illegality of these occurrences, and others like them, in a different manner.

The case of the tire factory, which because of poor quality control by the firm through which the tires were sold in Germany, is in a position in which it can barely survive, is only one of the larger examples of dishonest operations. Much more frequent are examples of the conscious involvement of firms in operations which give a great deal of money to individuals in order to get secret commissions, bribes because of the choice of a certain technological process, for the signing of unfavorable contracts, etc.

The system and network of foreign trade representatives is a special story. This powerful organization is quite exclusive; with the well-funded personal interests of individuals and their powerful connections in all social structures, it has been spared for the time being from essential changes which would otherwise be provided for in the Long-Range Program for Economic Stabilization. Without such systemic and cadre changes in the position and in the structure of this network, crime will continue to flourish.

#### Under Protection of Opportunism

The increase in all kinds of economic crime truly induces a feeling of helplessness on the part of society in opposing this ever expanding phenomenon. However, there cannot be an effective struggle against this evil if its most important causes have not been ascertained. There are many causes, but five of them are probably the most important: undeveloped self-management, selection and placement of incapable and morally unfit people in positions involving management of social property, familiarity and false solidarity, mediocre work of social-political organizations, and lenient punishment. If one out of every eight offender gets into this mess again because he is entrusted again to administer social property, if new and better positions are sought and found for managers who have ruined a labor organization, if in the case of scandals such as the Obrovac and the Belgrade Engineering incidents, and others, those who were responsible for failures are not revealed, then life will be made easier for criminal activities. Without a cadre policy which serves to protect the integrity of social property or self-management, there can be no effective struggle against economic crime.

False solidarity with economic criminals is a very strange phenomenon which requires deeper study. One of the reasons for this is the mediocre work of social-political organizations, especially the League of Communists. Private and group ownership mentalities, which have been planted in the consciousness of many working people, can only be broken by persistent political work. Today one can even find such drastic examples as the one in which a man in prison as a proven criminal has not been excluded from the ranks of his basic organization of the League of Communists. What sort of a communist organization is this, and what kinds of communists are these?

The most important course of action is in the development of self-management income relations. If a worker is alienated from self-management decisions, this very factor will destroy the social quality of ownership as well as weaken his motivation for protecting social property. However, it would be one-sided to reduce the battle against economic crime to efforts to develop further self-management relations, because undeveloped self-management

relations cannot serve as an alibi for thieves, and for other economic offenders. A strong defense of social property by supervisory organs and by the state is at the same time the best incentive for strengthening self-management relations. Passive worker controls have been stopped from the beginning on many occasions because they are discouraged by opposition, and even by threats, from bureaucratic, anti-self-management forces outside the labor organization.

One way to help is to have much more drastic means of punishment. What sort of punishment is it if a man appropriates a large and luxurious apartment from society (by illegal allotment), and is punished by party reprimand while being allowed to keep the apartment, or if he steals 100 million dinars, serves a few years in jail, while the money he stole is untouched? No, there should be no case in which the punishment is profitable. On the contrary, only drastic punishments, along with other measures, can check this powerful component which is assaulting social property.

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CSO: 2800/227

## **YUGOSLAVIA**

### **MACEDONIAN WORKERS ABROAD, UNEMPLOYED DISCUSSED**

Belgrade KOMUNA in Serbo-Croatian No 1, Jan 84 pp 34-38

[Excerpt] About 874,970 Yugoslavs and 250,000 members of their families work in Western Europe; of this number, 100,922 are from Macedonia. Yugoslav workers abroad are employed usually in fields in which the most acute crisis has been felt, such as construction, the electrical industry, the automotive industry, and so forth. Hence the problem of their return and their employment in Yugoslavia is a highly complex one. The situation in which the Yugoslav economy finds itself is a part of the general world economic crisis. The reduction of investments makes it difficult to create new jobs, with the result that it is impossible to accommodate both regular population growth and especially the unemployed and temporarily employed workers who have returned from abroad.

The unemployment problem in Macedonia is also one of the decisive factors of the policy of return of Yugoslav workers from abroad. The large number of unemployed persons (127,357 in 1982 and 128,403 as of 31 March 1983) creates particularly great difficulties for return from abroad of Yugoslav workers, whose number has already grown to exceed 100,000.

The situation in Macedonia is complicated by the skill structure of the unemployed, that is, persons seeking work in the country, as well as by that of workers returning from temporary employment abroad, who are also looking for work in Macedonia. This is shown by the data in Tables 1 and 2.

Another problem associated with return of Macedonian workers from abroad is the uneven territorial distribution of the returnees. The greatest number come precisely from the least developed communes. This creates a particular obstacle to their return and employment in their home communes.

### **Main Directions of Development of Private Economy and Areas of Greatest Potential and Need**

In view of the policy established for the long-term development of Macedonia, and on the basis of the level of development of its economy, urbanization, the standard of living, the number of Yugoslav workers temporarily employed abroad (according to a TANJUG dispatch of 16 November 1983, this number

Table 1. Persons Seeking Employment in Macedonia (by Skill Levels)

Skill Level	Year	
	1981	1982
1. Total employed	435,378	451,822
2. Unemployed	126,645	127,357
--Highly skilled and skilled	16,699	17,761
--Semiskilled and unskilled	76,896	74,385
--with high technical qualifications	2,969	3,232
--with intermediate technical qualifications	27,968	29,627

Table 2. Skill Structure of Macedonian Workers Employed Abroad in December 1982

Skill level	Number of Workers
1. Unskilled	19,162
2. Semiskilled	1,198
3. Skilled and highly skilled	10,201
4. Graduates of intermediate technical schools	33
5. Polytechnic Institute graduates	8

was 874,970 for Yugoslavia as a whole, together with 250,000 family members, and for Macedonia 100,922 persons, to which are to be added the approximately 128,000 unemployed in Macedonia), as well as the needs of workers and citizens for a wide variety of products and services which industry is not interested in providing, the development of the private economy as a whole, and particularly for implementation of the policy of returning Yugoslav workers from abroad, should be oriented toward several basic sectors in which the greatest needs and greatest possibilities exist.

This applies above all to services and other secondary activities. The very fact that today Macedonia has about 15 square meters of housing space per inhabitant, 400,000 radios, and 360,000 television sets, that 87 percent of households have a refrigerator, about 90 percent boilers, and that there is 1 automobile for every 9 inhabitants, is sufficient indication of the need and possibility of opening various service shops, making use of the resources and knowledge of Yugoslav returnee workers acquired abroad.

In addition to these services there is need for a large number of tradesmen services for repair of all other household appliances, electrical engineering articles and precision machinery, for provision of cabinetmaking, tile-laying, and wall papering and decorative services, for repair of plumbing fixtures, for various services in the field of communications, for machining services, etc.

There is also a need for establishing small production and service organizations. This is indicated by the fact that these activities have been only slightly developed (in the sphere of service crafts there are in Macedonia today only 71 organizations employing 7432 workers).

At a time of general struggle to increase food production, and considering the natural geographic and climatic conditions of Macedonia, agriculture and livestock raising are the next areas whose development could make a considerable contribution to the efforts for return and employment of our workers returning from abroad.

The unlimited demand for all types of foods, on the one hand, and the enormous amount of untilled land (about 140,000 hectares in Macedonia), on the other, open up prospects for developing the private economy in this area as well.

Inspired by these and similar examples found in our country (Slovenia, Croatia, Serbia), in its program for development to the year 2000 the city of Skoplje has provided that, by way of development of the private economy, 67 minifarms are to be established in the individual sector (31 in the commune of Kisela Voda, 21 in Karpos, 9 in the commune of Gaza Baba, and 6 in Cair), along with 27 larger farms. This program unquestionably offers a number of jobs for productive employment of workers returning from abroad. This example should be followed by other communities in Macedonia in which the conditions for such production are similar or better.

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